

Test Specifications

Fuel Injection Pumps ①A and Governors

40

VDT-WPP 001/4 DAI 1,9 1

2. Edition

En

PES 4 M 50 C 320/3 RS 44

EP/RSV 350-1500 MOB 119 DR
EP/RSV 350-1500 MOB 120 DR

supersedes 11.65
 company Daimler-Benz
 engine OM 621.931
 OM 621.916
 (Unimog) 421-40 PS
 or 34 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

/ RW 18

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery		Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery		Spring pre-tensioning (torque-control valve) mm 6	
		②	cm³/100 strokes 3			cm³/100 strokes 3	mm 6		
1000	12	1,9-2,2		0,3					
	9	0,7-1,2							
	18	3,7-4,6							
200	9	0,6-1,1							

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2		Intermediate rated speed mm rev/min 3			④ Control-lever deflection in degrees 7	Lower rated speed Control rod travel mm 8		③ Torque control rev/min 10	Control rod travel mm 11	
	4	5	6	8	9		10	11			
ca. 52	1500	16	without auxiliary spring	ca. 20	350	8	1480	0	1200	0,5-0,7	
	1550	12,5			200	19-21	1000	0,9-1,1			
	1600	8,4			350	7,7-8,3	500	0,9-1,1			
	1580	8,5-11	with auxiliary spring		600	4,4-6,2			1050	0 - 1	
	1650	5,0-6,6			800	0 - 4					
	1750	3,2-5,2			1050	0 - 1					
2a	1800	0 - 1									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F) rev/min 1	⑥ Rotational-speed limit Note changed to) rev/min 3		③ Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		⑤ Idle stop Control rod travel mm 8	④a Idle stop Control rod travel mm 9
	2	cm³/1000 strokes	5	cm³/1000 strokes	7	cm³/1000 strokes		
20°	1480	33,0-34,0	1510-1530	1000 500	34,2-36,2 33,2-35,2	100	20 mm RW	
40°	1480	32,7-33,7	1510-1530	1000 500	34,0-36,0 33,0-35,0			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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8.66

The numbers denote the sequence of the tests

B. Governor Settings

EP/RSV 350-1500 MOB 120 DR

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
1	2	3	4	5	6	7	8	9	10	11
ca.52	1500 1550 1600	16 12,4 8,4	without auxiliary spring	ca.20	350 200 350 600 800 1050	8	1480 1200 1000 500	0 0,2-0,4 0,7-0,9 1,1-1,3	0 0,2-0,4 0,7-0,9 1,1-1,3	0 0,2-0,4 0,7-0,9 1,1-1,3
2a	1580 1650 1750 1900	8,5- 11 5,0-6,4 1,6-4,0 0 - 1								

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limitat. Note: changed to ...) rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ Idle stop Control rod travel mm	
rev/min	cm³/1000 strokes	3	4	5	6	7	8	9
20°	1480	27,7-28,7	1510-1530	1000 500	29,7-31,7 28,4-30,4	100	20 mm RW	
40°	1480	27,4-28,4	1510-1530	1000 500	29,4-31,4 28,2-30,2			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting Gauge pressure =	Measurement Gauge pressure =	Control rod travel-difference mm (1)

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 i

1. Edition

En

supersedes -

company
engineDaimler-Benz
OM 621.913
(O/L 319 D - 50PS)PES 4 M 50 A 320 RS 14
S 14 z

EP/MN 60 M 14 d

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

/ RW 18

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,4	0,2			
	9	0,8-1,2				
	18	3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
1	Vacuum pressure drop mm water col.	Time at least s	2	Vacuum	Control rod travel mm	Vacuum	Control rod travel mm	Vacuum	Control rod travel mm	Vacuum	Control rod travel mm
2,6+0,1	500-480	10	-	-	-	-	-	405*	12,7-12,9	75	15,3-15,4
								435	8 - 12	180	14,5-14,9
								450	5 - 10	350	13 - 13,4
								500	0 - 5,6		

control rod travel test (cols. 4-11)
*= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics				idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm ³ /1000 strokes	
rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	8	
1850	405	28,7-29,7	1400	300	28,2-30,2				**	
			800	95	31,7-33,7				See page	2
			250	ca. 450	4,5-10,5					
				dispersion max.	1,5					

Checking values in brackets

1.62

B. Governor Settings

S 14 z with .. M 14 d DAI 1,9 i -2-

Torque control travel mm 1	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mm w.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9 **	Vacuum mm w.c. 10	Control rod travel mm 11	
2,6+0,1	500-480	10	-	-	-	-	405* 11,8-12 435 6,6-11,1 450 4 - 9,6 500 0 - 5,5	75	14,4-14,5 180 13,6-14,1 350 12 - 12,5		

control rod travel test (cols. 4-11)
*= rotational speed 500 rev/min
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics						idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes 8	
rev/min 1	Vacuum mm wat col 2	cm³/1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm³/1000 strokes 6	rev/min 7	Vacuum mm wat col 8					
1850	405	25,2-27,7 (25,7-26,7)	1400 800	300 95	25,2-27,2 (28,7-30,7)				**			

Checking values in brackets

* Set breakaway between 410-and 430 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At n = 500 and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 405 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 405 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel 2.0 ± 0.5 mm less - than in full-load position measured at 405 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

.. Further increase WG until control rod is set to 2.0 mm less control-rod travel than that measured in full-load position and with WG 405 mm.

... If the spring retainer is correctly set, the control-rod travel must now be 1.1 ± 0.5 mm less.

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 HAN 1,8 b

1. Edition

En

PES 4 M 50 B 320 RS 39

EP/MN 60 MA 5 D, MA 18 D, 30 D
EP/MN 60 MA20DR, MA 21 DRsupersedes
company
engine-
Hanomag
D 301

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,6	0,2			
	9	0,8-1,1				
	18	3,9-4,6				
200	9	0,7-1,0				

Adjust the fuel delivery from each outlet according to the values in ()

B. Governor Settings

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring MA 18		Drgage control	
1	Vacuum mm water col.	Time s	at least	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
1,0+0,1	500-480	10						565	12,1*	200	13,1-13,2
*	Breakaway at 600-620 mm WG by inserting shims beneath governor spring.							650	2,8-8,2	300	12,9-13,2
control rod travel test (cols. 4-11)								750	1,5-3,0	450	12,2-12,5
= rotational speed 500 rev/min.											
adjust breakaway (cols. 4-5) by means of shims*											
cam adjustment (B 8-9 - C 7-8) by means of shims**											

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics				idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	8	
2000	565	30,7-31,7	1400	300	29,2-31,2				See page 2	
			500	0	27,2-29,2					
			250	1000	6,5-11,5					
					dispersion max. 1,5					

Checking values in brackets

11.66

B. Governor Settings

MA 20 DR, MA 21 DR HAN 1,8 b

-2-

Torque control travel mm 1	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mm w.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9 **	Vacuum mm w.c. 10	Control rod travel mm 11	
0,7+0,1 500-480	10	330	14,4				*350 380 400	14,4 7,5-13,2 3,0-10,2	25 100 200	15,1-15,2 14,9-15,1 14,5-14,7	

* Breakaway at 350-375 mm WG by inserting shims beneath governor spring.

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min 1	Vacuum mm wat col 2	cm³/1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm³/1000 strokes 6	rev/min 7	Vacuum mm wat col 8	cm³/1000 strokes 8	
1500	330	28,7-30,2	1000 500	150 45	27,9-30,4 27,7-30,7				

Checking values in brackets

** Setting of idle stop (for MA 5 D and MA 18 D):

At n = 500 and with lug cam disconnected, move control rod to full-load position by increasing WG to 565 mm and measure control-rod travel obtained. Further increase WG until the control rod is set to 2.0 mm less control-rod travel than that measured in the full-load position at WG 565 mm; slowly press lug cam into end position. If the spring retainer is correctly positioned, the control rod must be set to 0.8 ± 0.3 mm less control-rod travel than that measured in the full-load position with WG 565 mm.

** Setting idle stop (for M 20 R and M 21 R):

At n = 500 and with lug cam disconnected, move control rod to full-load position by increasing WG to 350 mm. Measure control-rod travel, further increase WG until control-rod travel is 4 mm less than that measured with WG 350; slowly press lug cam into end position.

If the spring retainer is correctly set, the control rod must now exhibit $3.2 + 0.2$
 $- 0.3$ less control-rod travel than originally measured with WG 330.

No starting quantity measurement: however the excess travel of the spring-mounted full-load stop is to be checked (4.1 - 0.5 mm). (Only for M 21 DR)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 HAN 1,8 c
1. Edition

En

PES 4 M 50 C 320 RS 39

EP/MN 60 M 22 DR (V933D)

supersedes
company
engine

-
Hanomag
D 301

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,6	0,2			
	9	0,8-1,1				
	18	3,9-4,6				
200	9	0,7-1,0				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm	Leakage Vacuum pressure drop mm water col.	Time at least s	Control-rod travel limitation breakaway* Vacuum mm w.c. Control rod travel mm	Control rod travel test Vacuum mm w.c.	Control rod travel mm	Auxiliary spring auxiliary cam** Vacuum mm w.c. Control rod travel mm	Torque control Vacuum mm w.c.	Control rod travel mm		
1	2	3	4	5	6	7	8	9	10	11
1,2+0,1	500-480	10	- - -	-	-	530 12,2* 575 5,7-11,4 675 0 - 2,5	175	13,4-13,5 275 12,9-13,3 375 12,3-12,7		

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics						idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes
rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	vacuum mm wat. col	8
2000	530	30,7-31,7	1400	320	29,2-31,2	250	dispersion max.	1,5	** b.w.		
			500	0	27,2-29,2						

Checking values in brackets

2.67

BOSCH

Geschäftsbericht KH. Kundendienst. Kfz-Ausrüstung.
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* Breakaway at 550-570 mm WG by inserting shims beneath governor spring.

** Setting idle stop

At $n = 500$ and with lug cam disconnected, move control rod to full-load position by increasing WG to 530 mm and then measure control-rod travel obtained. Further increase WG until control rod has adjusted to 2.0 mm less control-rod travel than that measured in full-load position at WG 530 mm; slowly press lug cam into end position.

If spring retainer is correctly positioned, the control rod must adjust to 1.3 ± 0.3 mm less control-rod travel than that measured in full-load position with WG 530 mm.

No starting quantity measurement: however the excess travel of the spring-mounted full-load stop is to be checked (4.1 - 0.5 mm).

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 KHD 1,7 a

1. Edition

En

PES 3 M 60 A 420 RS 34	EP/RSV 300-1500 M2 B307	supersedes	-
4 320	EP/RSV 300-1500 M2 B309D	company	KHD
PES 3 M 60 A 320 RS 18	EP/RSV 300-1500 M 1/14	engine	F ₄ ³ L 310
4	EP/RSV 300-1500 M 1/14		

PES 4 M 60/320 RS 19

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

/ RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery	Spring pre-tensioning (torque-control valve) mm
		2	3				
1000	12	2,5-3,0		0,3			
	9	1,0-1,7					
	18	5,5-6,3					
200	9	0,2-0,9					

Adjust the fuel delivery from each outlet according to the values in □

B. Governor Settings

1 Degree of deflection of control lever	Upper rated speed rev/m.n		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	
ca.63	1500	16,0	without auxiliary spring	ca.24	300	8,0	1480	0	0
	1560	12,0			150	20,5-21,0	500	0	
	1620	7,6			300	7,7- 8,3	360	1,2-1,8	
	1600	7,6-10,1			450	2,8-5,2			
2a	1700	2,2- 4,8	with auxiliary spring		700	0 - 1			
	1800	0,3-1,7							
	1850	0,3-1,0							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)	rev/min	cm ³ /1000 strokes	6 Rotational-speed limitat Note: changed to ... rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle rev/min	5 cm ³ /1000 strokes	4a Idle stop Control rod travel mm
				4	5			
1480	27,5-29,5		1520				300	8,0

Checking values in brackets

* 1 mm less control rod travel than col 2

3.67

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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm
1	2	3	2a	4	5	6	4	7	8	9	3	10	11
ca.63	1500	16,0						ca.24	300	8,0		1480	0
	1560	12,0		without auxiliary					150	20,5-21,0		1400	0
	1620	7,6		spring					300	7,7- 8,3		1200	0,5-0,7
	1590	8,3-10,6							500	4,0- 6,0		800	1,1-1,3
	1700	2,2- 4,9		with auxiliary					820	0 - 1		400	1,6-1,8
	1850	0,3- 1,0		spring									

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Idle stop		
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm	
1	2	3	4	5	6	7	8	9	10	
1480	27,2-29,2	1520		1100 500	23,7-26,7 25,2-28,2				300	8,0

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113300 - 1500 M 1/14
Control lever Vertical - 30°**B. Governor Settings**

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm
1	2	3	2a	4	5	6	4	7	8	9	3	10	11
ca.54	1500	16,0						ca.12	300	8,0		1480	0
	1540	11,8		without auxiliary					120	20,5-21,0		500	0
	1580	7,2		spring					300	7,7- 8,3			
	1550	9,6-11,8							480	1,4- 4,2		360	1,2-1,8
	1650	2,0- 4,4		with auxiliary					650	0 - 1			
	1800	0 - 1		spring									

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm
1	2	3	4	5	6	7	8	9	10
1480	27,5-29,5	1520							

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

Test Specifications Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 HAN 1,8 a
2. Edition

En

PES 4 M 50 B 320 RS 37,Z,Y	EP/RSV 300-1200 M2 B117DR	supersedes:
RS 45,Z,Y		company:
RS 37, 45	EP/RSV 300-1200 M2 B117DR*	engine:
RS 37, 45	EP/RSV 300-1500 M2 B322DR**	11.66 Hanomag D 301

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	0,8-1,2	0,2			
	12	1,8-2,4				
	15	2,8-3,4				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed rev/min	3	Torque control rev/min		
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm		
1	2	3	7	8	9	10	11	
ca. 45	1200	14,0	without auxiliary spring	ca. 19	300	7,5	1180	0
	1240	10,4			150	20,5-21,0	1050	0,5-0,7
	1270	6,8			300	7,3- 7,8	900	1,1-1,3
2a	1250	7,7-9,7	with auxiliary spring		500	3,6- 5,7	800	1,4-1,6
	1300	4,7-6,0			800	0 - 1	400	1,4-1,6
	1500	0,3-1,0						

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp 40°C (104°F)	6	Rotational-speed limitat Note changed to) rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	rev/min	4	cm³/1000 strokes	rev/min	7	8	9
1180	24,2-25,2		1220	850	27,9-29,9				
				500	26,4-28,4				
1180	21,7-22,7		1220	850	24,7-26,7	Z			
				500	24,7-26,7				
1180	22,7-23,7		1220	850	26,2-28,2	Y			
				500	25,2-27,2				

Checking values in brackets

* 1 mm less control rod travel than col 2

3.67

BOSCH

Geschäftsbericht KH Kundendienst Kfz-Ausrüstung
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B. Governor Settings

300-1300 M2 B117DR* HAN 1,8 a

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	
1	2	3	2a	4	5	6	4	7	8	9	10	11
ca. 49	1300	14,0						ca. 20	300	7,0	1280	0
	1350	9,4	without	auxiliary					150	20,5-21,0	1100	0,5-0,7
	1390	5,2	spring						300	6,7-7,3	900	1,3-1,5
	1360	7,5-9,5							500	2,5-4,8	500	1,6-1,8
	1400	4,2-5,8	with auxiliary						740	0 - 1		
	1560	0 - 1	spring				(3a)					

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	1	2	3	4	5	6	7	8	9	10
1280	24,2-25,2		1320		850 500	26,7-28,7 26,7-28,7					

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

300-1500 M2 B322DR**

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	
1	2	3	2a	4	5	6	4	7	8	9	10	11
ca. 60	1500	14,0						ca. 23	300	7,0	1480	0
	1550	10,0	without	auxiliary					150	20,5-21,0	1000	0,7-0,9
	1600	5,9	spring						300	6,7-7,3	800	1,4-1,6
	1550	9,0-10,5							500	3,0-5,0	500	1,4-1,6
	1600	4,8-7,0	with auxiliary						800	0 - 1		
	1800	0 - 1	spring				(3a)					

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	1	2	3	4	5	6	7	8	9
1480	25,4-26,4		1520		1200 850 500	23,7-25,7 26,9-28,9 26,4-29,4				

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

③ **Test Specifications
Fuel Injection Pumps ③ and Governors**

VDT-WPP 001/4 MB 1,9 k

2. Edition

PES 4 M 50 A 320 RS 14 EP/MN 60 M 15 D, 16 D; 19DR
RS 14 Z M 15 D, 16 D

supersedes
company:
engine:

3.65
Daimler-Benz
OM 621.912
(190 D - 55 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,4	0,2			
	9	0,8-1,2				
	18	3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
1	Vacuum mm water col.	pressure drop at least	Time s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
1,2+0,1	500-480	10	-	-	-	-	-	480*	13,7	150	14,9-15,0
								530	6,7-13,7	275	14,5-14,9
								600	0 - 6,7	375	13,9-14,2
								700	9,1-10,1		Set cam!

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	8	
governors 15D, 16D:	1600	330	1600	100	31,2-33,2	1200	100	31,7-33,7	** See page 2!
			1000						
governors 19D:	1600	330	1600	100	30,2-32,2	1200	100	30,7-32,7	
			1000						
			250	ca. 570	4,5-10,5				
				dispersion max.	1,5				

Checking values in brackets

12.74

B. Governor Settings

RS 14 Z with governors 15D, 16D

MB 1,9 k

-2-

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**			Torque control	
	Vacuum pressure drop mm water col	Time at least s	vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11		
1,2+0,1	500-480	10	-	-	-	-	480*	12,8	150	14 -14,1		
							530	6,6-12,8	225	13,8-14,1		
							600	0 - 6	375	13,0-13,3		
							700	8,8- 9,8		Set cam!		

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104 F)			Fuel delivery characteristics						idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat col	cm³/1000 strokes	rev/min	Vacuum mm wat col	cm³/1000 strokes	rev/min	Vacuum mm wat col	rev/min	Vacuum mm wat col	rev/min	Vacuum mm wat col	8
2000	480	29,7-30,7	1600	300	28,2-30,2				**			
			1000	100	28,7-30,7							
			250	ca. 540	4,5-10,5							
					dispersion max. 1,5							

Checking values in brackets

* Set breakaway between 500-and 530 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At n = 500 and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 480 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3,5 mm less control-rod travel - than in full-load position and measured at 480 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel $2,7 \pm 0,5$ mm less - than in full-load position measured at 480 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Pe 14. Z:

... Further increase WG until control rod is set to 3,0 mm less control-rod travel than that measured in full-load position and with WG 480 mm.

... If the spring retainer is correctly set, the control-rod travel must now be $2,5 \pm 0,5$ mm less.

Testoil-ISO 4113

(3)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 DAI 1,9 f

1. Edition

En

PES 4 M 50 A 320 RS 14 EP/MN 60 M 9 d

supersedes
company
engine

Daimler-Benz
OM 621.913
(O/L 319 D-50PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1 mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,4	0,2			
	9	0,8-1,2				
	18	3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
1	Vacuum pressure drop mm water col.	Time at least s	mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	
2,5+0,1	500-480	10	-	-	-	-	440*	12,4-12,7	50	14,9-15	
							475	8,2-12,2	200	14,1-14,4	
							550	0 - 5	400	12,7-13	

control rod travel test (cols. 4-11)
*= rotational speed 500 rev/min
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics						idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	Vacuum mm wat. col	cm³/1000 strokes	7	8		
2000	440	29,2-30,2	1400	300	28,2-30,2				**			
			800	95	31,7-33,7				See page 2!			
			250	ca. 480	4,5-10,5							
				dispersion max.	1,5							

Checking values in brackets

8.61

BOSCH

Geschäftsbericht KH. Kundendienst. Kfz-Ausrüstung.
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Testoil-ISO 4113

A17

A17

* Set breakaway between 450-and 470 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At $n = 500$ and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 445 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 445 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel 2.0 ± 0.5 mm less - than in full-load position measured at 445 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Note: This change also alters the initial tension in the spring retainer. It is therefore to be returned to the prescribed initial tension of 50-90 g again by inserting shims between spring and bottom of spring bolt.

With cam set and governor control lever pressed through in STOP direction, control rod must assume control-rod travel 0.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 g

2. Edition

En

PES 4 M 50 A 320 RS 14
RS 14 Z

EP/MN 60 M 11 d

supersedes 8.61
company Daimler-Benz
engine OM 621.914
(180 DC-48 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1 mm (from BDC)

/ RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,4	0,2			
	9	0,8-1,2				
	18	3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*	Control rod travel test	Auxiliary spring auxiliary cam**		Torque control	
1	Vacuum mm water col	pressure drop mm water col	Time at least s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
2,1+0,1	500-480	10	-	-	-	520	11,9*	100	13,9-14
						560	10,2-11,5	200	13,6-13,9
						600	7,8- 9,5	400	12,2-12,6
						700	2,6- 5,4		

control rod travel test (cols 4-11)
* = rotational speed 500 rev/min.
** adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics				Idle (stop)** Idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	Vacuum mm wat. col	cm³/1000 strokes	rev/min	Vacuum mm wat. col	rev/min	cm³/1000 strokes	
1900	510	27,7-28,7	1000	150	28,7-30,7		** See page 2			
			500	0	27,7-29,7					
			250	ca. 610	4,5-10,5					
				dispersion max.	1,5					

Checking values in brackets

10.61

B. Governor Settings

DAI 1,9 g

-2-

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**			Torque control	
	Vacuum pressure drop mm water col	Time at least s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11		
2,1+0,1	500-480	10	-	-	-	-	520	11,0*	100	13,1-13,2		
							560	9,2-10,5	200	12,7-13		
							600	7 - 8,5	400	11,4-11,7		

control rod travel test (cols 4-11)

= rotational speed 500 rev/min.

adjust breakaway (cols. 4-5) by means of shims*

cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104 F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat col	cm³/1000 strokes	rev/min	Vacuum mm wat col	cm³/1000 strokes	rev/min	Vacuum mm wat col	8	
RS14Z 1900	510	24,7-25,7	1000	150	25,7-27,7	**			
			500	0	24,7-26,7				
			250	ca.590	4,5-10,5				
				dispersion max.	1,5				

Checking values in brackets

* Set breakaway between 530-and 550 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At n = 500 and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 510 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 510 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel 1,5±0,5 mm less - than in full-load position measured at 510 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Note: This change also alters the initial tension in the spring retainer. It is therefore to be returned to the prescribed initial tension of 50-90 g again by inserting shims between spring and bottom of spring bolt.

With cam set and governor control lever pressed through in STOP direction, control rod must assume control-rod travel 0.

En

A20

A10

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 e

1. Edition

En

PES 4 M 50 A 320 RS 14

EP/MN 60 M 7 d
M 8 dsupersedes
company
engine-
Daimler-Benz
OM 621, 912
(190 D - 55 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1 mm (from BDC)

/ RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,4	0,2			
	9	0,8-1,2				
	18	3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm	Leakage Vacuum pressure drop mm water col.	Time at least s	Control-rod travel limitation breakaway* mm w.c.	Control rod travel mm	Control rod travel test Vacuum mm w.c.	Control rod travel mm	Auxiliary spring auxiliary cam** Vacuum mm w.c.	Control rod travel mm	Torque control Vacuum mm w.c.	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
1,6+0,1	500-480	10	-	-	-	-	565* 13,3-13,6 595 8,5-12,8 670 3,2- 5,6	100 14,9-15 300 14,9-15 380 14,4-14,7 540 13,4-13,7	100 14,9-15 300 14,9-15 380 14,4-14,7 540 13,4-13,7	
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**										

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	8	
1	2	3	4	5	6	7			
2150	560	31,2-32,2	1400 500	310 0	30,7-32,7 29,2-31,2		** See page	2	

Checking values in brackets

8.61

BOSCH

Geschäftsbericht KH. Kundendienst. Kfz-Ausrüstung.
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 Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

Testoil-ISO 4113

* Set breakaway between 560-and 590 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At $n = 500$ and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 560 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 560 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel 2.0 ± 0.5 mm less - than in full-load position measured at 560 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Note: This change also alters the initial tension in the spring retainer. It is therefore to be returned to the prescribed initial tension of 50-90 g again by inserting shims between spring and bottom of spring bolt.

With cam set and governor control lever pressed through in STOP direction, control rod must assume control-rod travel 0.

① Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 DAI 4,6 g (4,6 h)

2. Edition

En

PES 6 A 80 B 410 RS 64

RQ 1075 A 90

supersedes 9.59
 company: Daimler-Benz
 engine: OM 312

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	5,5-6,0	0,3			
	6	2,2-3,0				
	15	11,6-12,8				
200	6	1,3-2,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed Degree of deflection of control lever	Control rod travel mm	Control rod travel rev/min	Intermediate rated speed Degree of deflection of control lever	Control rod travel mm	Lower rated speed Degree of deflection of control lever	Control rod travel mm	Sliding sleeve travel rev/min	Sliding sleeve travel mm
1	2	3	4	5	7	8	10	11
30°	1040	18-22						
	1080	13-16						
	1120	5,6-11,3						
	1140	0,5-8,5						
	1190	0						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)	Rotational-speed limitation intermediate speed rev/min	Fuel delivery characteristics high idle speed rev/min	Starting fuel delivery idle switching point rev/min	Torque-control travel Control rod travel rev/min
1	2	3	4	5
1050	53,0-55,0	1075		

Checking values in brackets

* 1 mm less control rod travel than col. 2

① **Test Specifications
Fuel Injection Pumps ①
and Governors**

40

VDT-WPP 001/4 DAI 4,6 x (4,6x1)

2. Edition
En

PES 6 A 70 B 410 RS 64

RQV 250 - 1400 A 140 D

supersedes
company:
engine:

8.58
Daimler-Benz
OM 312

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	6,5-7,0	0,4			
	6 18	1,2- 1,9 11,1-11,9				
200	6	0,6- 1,5				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel		①			
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	①	rev/min	mm
1	2	3	②a	4	5	6	④	7	8	9	③	10	11	
65±1,5	1400	15 - 17,6	③a					10±1,5	150	7,4-8	④a	1400	0	
	1440	11,6-15							250	5,4-7,4		1200	0,4-0,6	
	1520	4,4-9,6							400	3,6-4		800	0,8-1,0	
	1600	0 - 4,2							700	1,7-3,4		500	0,8-1,0	
	1660	0							950	0				

Torque control travel a = 1,0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm³/1000 strokes	②b rev/min	⑤a rev/min	⑥ cm³/1000 strokes	⑤ Control rod travel rev/min
1	2	3	4	5	8
1000	43,5-45,5	1400-1420	500 1400	44,5-47,5 45,5-48,5	100 mind. 7,9

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.64

Test Specifications Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 MB 2,2 d

1. Edition

En

PES 4 M 55 C 120 RS 49

EP/RSV 350-2000 MO B124D (1)
EP/RSV 350-1500 MO B126D (2)
EP/RSV 350-1750 MO B127D (3)

supersedes

company
engine

Daimler-Benz
OM 615 (60PS-1)
OM 616.915 (52PS-2)
OM 616.930 (60PS-3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	12	2,1-2,6	0,3			
1000	9	1,1-1,7				
	18	4,1-4,9				
200	9	0,5-1,0				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Control lever vertical = scale 50°
350-2000 MO B124D (1)

Degree of deflection of control lever	1 Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3				7	8	9	10	11
ca.55	2000	16,0	without auxiliary spring	ca.18	350	8,5	1980	0	1300	0,7-0,9
	2060	13,0			200	20,5-21,				
2a	2120	8,2			350	8,2- 8,8	600	5,0- 6,8	600	0,7-0,9
	2100	8,0-11,0	with auxiliary spring		600	5,0- 6,8				
2a	2200	3,2- 6,0			700	2,8- 5,8	1100	0 - 1	1980	0,7-0,9
	2400	0 - 1			1100	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)	6 Rotational-speed limitat		3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop Control rod travel mm
	rev/min	cm³/1000 strokes	Note: changed to) rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	
1	2	3	4	5	6	7	8	9
2000	35,2-37,2	2020	1600	34,7-37,7	100	ca.20mmRW		
			1000	32,2-35,2	350	4,5-10,5		
						dispersion max.1,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.71

BOSCH

Geschäftsbericht KH Kundendienst Kfz-Ausrüstung
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B. Governor Settings

350-1500 MO B126D (2)

MB 2,2 d

-2-

(1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a	Degree of deflection of control lever	rev/min mm	Control rod travel	4	Degree of deflection of control lever	rev/min mm	Control rod travel	3	Sliding sleeve travel
1	2	3	2a	4	5	6	7	8	9	10	11	1
ca.52	1500	16,0					ca.20	350	7,5			
	1550	12,6						200	19-21	1480	0	
	1600	8,5						350	7,2-7,8			
	1550	11,8-13,4						600	4,1-5,9	1000	0,2-0,4	
	1700	3,2- 5,4						1000	0 - 1			
	1900	0 - 1										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	4a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1500	39,2-41,2			1000	39,2-41,2	350	4,5- 10,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

Control lever vertical= scale 50°
350-1750 MO B127DR (3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a	Degree of deflection of control lever	rev/min mm	Control rod travel	4	Degree of deflection of control lever	rev/min mm	Control rod travel	3	Sliding sleeve travel
1	2	3	2a	4	5	6	7	8	9	10	11	1
ca.63	1750	16,0					ca.21	350	8,0			
	1800	13,0						200	19,0-21	1730	0	
	1860	8,0						350	7,7-8,3			
	1800	12,0-13,5						700	2,4-5,3	1400	0,2-0,4	
	2000	1,5- 4,5						1100	0 - 1	600	0,8-1,0	
	2200	0 - 1										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel			
rev/min	cm³/1000 strokes	rev/min	4a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm		
1	2	3		4	5	6	7	8	9		
1730	40,2-42,2			1770	1000	39,2-42,2	100	ca.20 mm RW			
								350	4,5-10,5		
									dispersion max.1,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

B20

B20

(3) Test Specifications Fuel Injection Pumps (3) and Governors

VDT-WPP 001/4 MB 2,2 a

2. Edition

PES 4 M 55 C 320 RS 47, Z

EP/MN 60 M 23 DR (1)*
 EP/MN 60 M 26 DR (2)
 EP/MN 60 M 34 DR (3)
 EP/MN 60 M 36 DR (4)

supersedes

company:

Daimler-Benz

OM 615. ..

912-PKW220D (1)

910-L/0 309 (2)

936 Tunnelling or mining vehicles
HHF (3-4)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 +0,1 mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	12	2,1-2,6	0,3			
	9	1,1-1,7				
	18	4,1-4,9				
200	9	0,5-1,0				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Torque control travel mm	Leakage			Control rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
1	2	3	4	5	6	7	8	9	10	11	
2	3	4	5	6	7	8	9	10	11		
1,1±0,1	500-480	10	-	-	-	-	470	13,8**	200	14,8-15,0	
** Breakaway at 490-510 mm WG by inserting shims beneath governor spring.											
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**											
Set cam! 550 10,6-11,4 650 9,7-10,6											

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics				idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	8	
1	2	3	4	5	6	7	7	8	8	
2250 (1-3)	470	35,7-36,7 (35,2-37,2)	1600	325	36,4-37,9	250	4,5-10,5	cm³/1000	1,5	
			1000	135	34,2-35,7	dispersion max.	***			
							./.			

Checking values in brackets

5.72

Testoil-ISO 4113

B. Governor Settings

.23DR, 26DR, Pe..S 47 Z

-2-
MB 2,2a

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col.	Time at least s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
1,1±0,1	500-480	10	-	-	-	-	470	12,9**	200	13,9-14,1	
** Breakaway at 490-510 mm WG by inserting shims beneath governor spring.											
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**											
Set cam!											
550 9,6-10,5 650 8,8-9,7											

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics						idle (stop)** idle (imbalance)		Control road travel from full-load to idle mm cm³/1000 strokes
rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	vacuum mm wat. col.	8
"Z" (1-2)	2250	470	32,2-33,2	1600	325	32,9-34,4	250	4,5-10,5	cm³/1000	1,5 ***	1,5 less less ***
	1750	450	34,7-35,7	1000	135	30,7-32,2	dispersion max.	3,5 mm	mm		
(4)				250		4,5-10,5)	1,5±0,5mm			

Checking values in brackets

B. Governor Settings

.36 DR Pe..S 47

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col.	Time at least s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
0	500-480	10	-	-	-	-	450	13,6**	-	-	
** Breakaway at 475-590 mm WG by inserting shims beneath governor spring.											
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**											
Set cam!											
550 11,4-12,4 650 10,6-11,6											

** Setting the idle stop:

At n = 500 and with governor stop cam switched off bring the control rod to the full-load position by increasing the water column to 470 mm and measure the control-rod travel reached. Increase the water column further until the control rod has adjusted itself to 3,5 mm less travel than in the full-load position and with water column 470 mm. In this position press the stop cam slowly through to the end position and observe the control rod.

If the spring retainer is correctly adjusted, the control rod must adjust itself to a $2,7 \pm 0,5$ mm lower control-rod travel than when measured in the full-load position and with water column 470 mm. If more or less than the adjusting value is reached, the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Testoil-ISO 4113

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 MB 2,2 b

2. Edition

En

PES 4 M 55 C 120 RS 49

EP/RSV 350-1500 MOB119DR
EP/RSV 350-1750 MOB122DR*
EP/RSV 350-2150 MOB327DR**

supersedes 1.68
company Daimler-Benz
engine OM 615.911*
914**

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7

mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,1-2,6	0,3			
	9	1,1-1,7				
	18	4,1-4,9				
200	9	0,5-1,0				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

350-1500

1	Upper rated speed rev/min		Intermediate rated speed	4	Lower rated speed		Torque control	
Degree of deflection of control lever	Control rod travel mm		Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm	
1	2	3	4	7	8	9	10	11
ca. 52	1500	16,0	without auxiliary spring	ca. 20	350	8	1480	0
	1550	12,5			200	19-21	1200	0,5-0,7
	1600	8,4			350	7,7-8,3	1000	0,9-1,1
(2a)	1580	8,5-11,0	with auxiliary spring	ca. 20	600	4,4-6,2	500	0,9-1,1
	1650	5,0- 6,6			800	0 - 4		
	1750	3,2- 5,2			1050	0 - 1		
	1800	0 - 1						

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop	6	Rotational-speed limitat	3a	Fuel delivery characteristics	Starting fuel delivery	5	4a	Idle stop
Test oil temp 40°C (104°F)	rev/min	Note changed to)	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5		6	7	8	9
1480	34,7-35,7		1520	1000	36,2-38,2	1000	20,0		
				500	34,2-36,2				
				350	7,5-11,5	1585	7,5-8,5		
					dispersion max. 1,5				

Checking values in brackets

* 1 mm less control rod travel than col 2

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B. Governor Settings

350-1750*

MB 2,2 b

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm
1	2	3	2a	4	5	6	4	7	8	9	3a	10	11
ca.63	1750	16,0						ca.21	350	8,0			
	1800	13,0		without		auxiliary			200	20,5-21	1730	0	
	1880	7,3		spring					350	7,7- 8,3	1200	0,3-0,5	
	1800	12,0-14,0							600	4,6-6,3	800	0,8-1,0	
	1900	5,5- 7,0		with auxiliary					800	0 -4,2	500	0,8-1,0	
	2150	0 - 1		spring					1100	0 -1			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed			Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	1	2	3	4a	rev/min	cm³/1000 strokes	6	7	8	9	Control rod travel mm
1	2	3				4	5					
1730	37,2-38,2			1770		1440	34,2-36,2	350	0,7-1,1			
						1000	35,7-37,7					
						500	33,7-35,7					

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

350 - 2150**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm
1	2	3	2a	4	5	6	4	7	8	9	3a	10	11
ca.60	2150	16,0						ca.19	350	8,0			
	2200	13,2		without		auxiliary			200	20,5-21	2130	0	
	2280	8,0		spring					350	7,7- 8,3	1800	0	
	2200	12,5-14,0							600	4,6- 6,4	1400	1,0-1,2	
	2400	1,5- 4,3		with auxiliary					800	1,0- 4,3			
	2550	0 - 1		spring					1060	0-1	600	1,0-1,2	

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed			Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	1	2	3	4a	rev/min	cm³/1000 strokes	6	7	8	9	Control rod travel mm
1	2	3				4	5					
2130	35,7-36,7					1600	35,9-37,9	100	20 mm RW	350	8,0	
						1000	32,4-34,4					
								350	0,4-1,0			
									dispersion max.0,15			

Checking values in brackets

* 1 mm less control rod travel than col. 2

③

Test Specifications Fuel Injection Pumps ③ and Governors

40

En

VDT-WPP 001/4 MB 2,2 c

1. Edition

PES 4 M 55 C 320 RS 47

EP/MN 60 M 27 DR
EP/MN 60 M 29 DR
EP/MN 60 M 35 DR

supersedes

company:

Daimler-Benz
OM 615

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 ± 0,1 mm (from BDC)

max. RW

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	12	2,6-2,9	0,3			
	9	1,4-2,0				
	18	-				
200	9	0,8-1,3				

Adjust the fuel delivery from each outlet according to the values in □.

B. Governor Settings

Torque control travel mm	Leakage			Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
1	Vacuum pressure drop mm water col.	Time at least s	2	Vacuum	Control rod travel mm	Vacuum	Control rod travel mm	Vacuum	Control rod travel mm	Vacuum	Control rod travel mm
	mm			mm w.c.	mm	mm w.c.	mm	mm w.c.	mm	mm w.c.	mm
0,8+0,1	500-480	10	-	-	-	-	-	470	13,5*	150	14,2-14,4
								510	7,5-13,5	350	13,8-14,2
								550	2,1- 9,1		
								650	0 - 2,6		
								550	10,2-11,2	-	Set cam!
								650	9,4-10,4	"	

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm³/1000 strokes	
rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	cm³/1000 strokes	rev/min	Vacuum mm wat. col.	8	
1	2	3	4	5	6	7	7	8	
2250	470	34,7-35,7 (34,2-36,2)	1600	325	34,9-36,9	**			
			1000	125	31,4-33,4				
			250		4,5-10,5				
				dispersion max.	1,5				

Checking values in brackets

12,74

Testoil-ISO 4113

* Set breakaway between 490-and 510 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At $n = 500$ and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 470 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3,5 mm less control-rod travel - than in full-load position and measured at 470 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel $2,7 \pm 0,5$ mm less - than in full-load position measured at 470 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4 MB 8,3 r

2. Edition

En

PES 6 AM 90 B 410 R 2, R 5, R 9
RS 2001

RQ 250/1075 A 223 D

supersedes
company:
engine:

3.64
Daimler-Benz
OM 315 91

"diesel" = flap touching
"gasoline" = flap free-standing

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed- rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	5,9-6,4	0,4			
	6	2,3- 3,1				
	15	14,2-15,5				
200	9	3,8- 4,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Setting point Control rod travel mm	Test specifications Control rod travel mm	Setting point Control rod travel mm	Test specifications Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1000	14,2-15	1000	14,6	1080	14,4-14,6	530	0	100	6,8-8	400	16 -21
				1100	10 -14,6			200	5,4-7,6	600	15,3-15,6
				1120	4 -11			300	3 - 5		
				1140	0 - 8,5			380	0 -2,5	800	14,8-15
				1200	0			430	0	900	14,6-14,7

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	Control rod travel
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm
1	2	3	4	5	6	7
1050	96,5- 98,5		500	94,5-98,5	100	mind.13,4
1000	120,5-124,5		700	92,5-95,5		

Checking values in brackets

10.68

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4 MB 8,3 q (8,3 r)

2. Edition

En

PES 6 A 80 B 410 RS 64

RQ 250/900 A 83 D

supersedes
company:
engine:

3.64
Daimler-Benz
OM 315

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,15 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,5- 6,0	0,4			
	6	2,2- 3,0				
	15	11,6-12,8				
200	6	1,3- 2,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check Control rod travel rev/min 1		Full-load speed regulation Setting point Control rod travel rev/min 3				Idle speed regulation Setting point Control rod travel rev/min 7				Torque control Control rod travel rev/min 11	
		Control rod travel mm 2	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Control rod travel mm 8	Test specifications Control rod travel mm 9	Control rod travel mm 10		Control rod travel mm 12	
850	14,8-15,6	850	15,2	900 920 940 960 1000	14,8-15,2 9 -15,2 3 -12 0 - 8 0	520	0	200 250 300 370 420	6 - 8 5 - 7 3,4-5,8 0 - 1 0	400 500 600	16-21 15,4-15,7 15 - 15,2

Torque-control travel
on flyweight assembly dimension a =

0,3 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4			Starting fuel delivery Idle speed rev/min 6	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	cm³/-1000 strokes 5		cm³/1000 strokes/mm 7		rev/min 6	cm³/1000 strokes/mm 7
880	96,0-98,0	500	500 700	93,5-97,5 92,0-95,0			100	mind. 13,4

Checking values in brackets

10.68

Testoil-ISO 4113

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 IHC 2,2 r

2. Edition

En

PES 4 M 65 B 420 LS 35 V	EP/RSV 250-..M 1 A 110 D	
LS 55 U	M 1 A 111 D	
LS 35 T	M 1 A 112 D	
LS 35 S	M 1 A 113 D	
LS 35 R	M 1 A 115 D	

supersedes 4.62
company IHC
engine DD 132, DD 148

EP/RSV 250-1200 M 2 A 109 D
M 2 A 114 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm³/100 strokes	Control rod travel mm	Fuel delivery		Spring pre-tensioning (torque-control valve) mm
		2	3			2	3	
1000	12	3,2-3,7						
	9	1,5-2,3						
	18	6,7-7,5						
200	9	0,6-1,3						

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

EP/RSV 250-750 M 1 A 110 D

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		Control rod travel mm	rev/min	Control rod travel mm	rev/min
ca.45	750	16	without auxiliary spring	ca.26	250	9	730	0	500	0,4-0,6
	800	12			100	19-19,5				
	830	8,6			250	8,7- 9,3				
2a	820	8,5-11,5	with auxiliary spring		400	5 - 7	700		500	0,4-0,6
	900	4 - 6,4			500	0,5- 5				
	1050	0 - 1			700	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	rev/min	cm³/1000 strokes	6 Rotational-speed limitat Note changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle	5 Idle stop	4a Idle stop
				rev/min	cm³/1000 strokes			
730	34,0-36,0		760	500	36,5-39,5			

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.65

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C9

B. Governor Settings

EP/RSV 250-750 M 1 A 113 D IHC 2,2 r

-2-

1

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a Degree of deflection of control lever	rev/min	Control rod travel mm	4 Degree of deflection of control lever	rev/min	Control rod travel mm	3 rev/min	mm
1	2	3	2a 4	5	6	7	8	9	10	11
ca.42	750	16				ca.23	250	9	730	0
	790	11,8	without spring	auxiliary			100	19-19,5	500	0,6-0,8
	820	8,3					250	8,7- 9,3		
	800	9,5-12					400	4,8- 6,8		
	900	3 - 5,5	with auxiliary spring				500	0 - 4,8		
	1050	0 - 1				(3a)	650	0 - 1		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	4a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
730	38,0-40,0	760		500	42,0-45,0				

LS 35 R Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

EP/RSV 250-900 M 1 A 111 D

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a Degree of deflection of control lever	rev/min	Control rod travel mm	4 Degree of deflection of control lever	rev/min	Control rod travel mm	3 rev/min	mm
1	2	3	2a 4	5	6	7	8	9	10	11
ca.49	900	16				ca.24	250	9	880	0
	950	11,6	without spring	auxiliary			100	19-19,5	700	0,4-0,6
	980	8					250	8,7- 9,3	500	0,7-0,9
	960	8,2-11,4					400	5 - 7		
	1000	5,8- 7,8					500	0 - 5		
	1050	2,5- 5,5	with auxiliary spring			(3a)	700	0 - 1		
	1150	0 - 1								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	4a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
880	32,5-34,5	910		500	36,5-39,5				
				700	35,5-37,5				

LS 35 V

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

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B. Governor Settings

EP/RSV 250-900 M 1 A 112 D IHC 2,2 r

-3-

1

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	Sliding sleeve travel ① rev/min mm	
1	2	3	②a	4	5	6	④	7	8	9	③	10	11
ca. 49	900	16						ca. 24	250	9		880	0
	950	11,4		without auxiliary					100	19-19,5		700	0,2-0,4
	970	9	spring						250	8,7- 9,3		500	0,4-0,6
	950	10-12,4							400	5 - 7			
	1000	6 - 8	with auxiliary						500	0 - 5			
	1200	0 - 1	spring						700	0 - 1			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a			Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	1	rev/min	3	rev/min	cm³/1000 strokes	6	cm³/1000 strokes	8	rev/min	control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	9
880	38,5-40,5		910		500	42,0-45,0					
					700	40,0-42,0					

LS 35 T Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

EP/RSV 250-1000 M 1 A 110D, 115D*

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	Sliding sleeve travel ① rev/min mm	
1	2	3	②a	4	5	6	④	7	8	9	③	10	11
ca. 54	1000	16						ca. 25	250	9		980	0
	1050	11		without auxiliary					100	19-19,5		700	0,7-0,9
	1070	8,4	spring						250	8,7- 9,3		500	1,0-1,2
	1060	8 - 11							400	5 - 7			
	1100	5 - 7	with auxiliary						500	0 - 5			
	1150	1,8-4,6	spring						700	0 - 1			
	1250	0 - 1											

LS 35 S Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a			Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	1	rev/min	3	rev/min	cm³/1000 strokes	6	cm³/1000 strokes	8	rev/min	control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	9
980	32,0-34,0		1010		500	36,5-39,5	*				
					700	35,5-37,5	100	1 mm control-rod travel more than at n 500 and control lever max. (at 115 D)			

LS 35 S Checking values in brackets

* 1 mm less control rod travel than col. 2

En

C11

CA1

B. Governor Settings

EP/RSV 250-1000 M 1 A 112 D IHC 2,2 r

-4- ①

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel ①
1	2	3	2a	4	5	6	7	8	9	10	11	
ca.54	1000	16					ca.25	250	9,3	980	0	
	1050	11		without	auxiliary			100	19-19,5	700	0,3-0,5	
	1070	8,6		spring				250	9- 9,6	500	0,7-0,9	
	1050	10-12						400	5,2- 7,4			
	1100	5,7-7,8		with auxiliary			(3a)	500	0,8- 5,4			
	1150	2,2-5,4		spring				700	0 - 1			
	1250	0 - 1										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤b			Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	1	rev/min	4a	rev/min	cm³/1000 strokes	6	rev/min	cm³/1000 strokes	8	Control rod travel mm
2	3	2	3	4	5	7	8	9	10	11	9
LS 35 T	980	37,5-39,5		1010	500	42,0-45,0		700	40,0-42,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

EP/RSV 250-1200 M 2 A 109 D,114 D*

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel ①
1	2	3	2a	4	5	6	7	8	9	10	11	
ca.54	1200	16					ca.25	250	9	1180	0	
	1300	10,4		without	auxiliary			100	19 - 19,5	700	0,7-0,9	
	1330	8,2		spring				250	8,7- 9,3	500	1,0-1,2	
	1300	9 - 11,5						400	6,5- 8			
	1400	4,4- 6,6		with auxiliary			(3a)	500	4,4- 6,8			
	1500	0,5- 3,8		spring				600	1,5- 5,5			
	1650	0 - 1						900	0 - 1			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤b			Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	1	rev/min	4a	rev/min	cm³/1000 strokes	6	rev/min	cm³/1000 strokes	8	Control rod travel mm
2	3	2	3	4	5	7	8	9	10	11	9
LS 35 V	1180	34,0,36,0		1210	500	36,5-39,5	*	700	35,5-37,5		more

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4

1. Edition

En

PES 4 M 65 B 320/3 RS 43

EP/RSV 350-1100 M 2 B 317 DR

supersedes
company
engine

-
Vendeuvre
F 118

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1 mm (from BDC) RW 16

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7	0,2			
	9	1,5-2,3				
	18	6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Degree of deflection of control lever 1	1 Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca. 46	1100	16	without auxiliary spring	ca. 23		350	8,5	1080	0	
	1160	12				150	20,5-21			
2a	1220	7,2	with auxiliary spring			350	8,2- 8,8	850	0,9-1,1	
	1200	7-10				600	2,5- 5,5			
	1300	3- 3,5				850	0 - 1	700	1,4-1,6	
	1500	0- 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat	3a Fuel delivery characteristics		Starting fuel delivery Idle	5	4a Idle stop	
Test oil temp. 40°C (104°F)	rev/min	Note changed to) rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1080	24,0-25,0	1100-1120	700	26,8-28,5	100	20 mm RW	350	8-8,5
			600	25,5-27,5				
			1160	5,5 - 6 mm RW				

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.64

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Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4

1. Edition

En

PES 4 M 65 C 320 RS38

EP/RSV 350-1500 M2 B341 DR

supersedes -
company Allis Chalmers
engine D 118

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1

mm (from BDC)

max. RW

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
		2	3				
1000	12	3,3-3,7		0,3			
	9	1,5-2,3					
	18	6,7-7,5					
200	9	0,6-1,3					

Adjust the fuel delivery from each outlet according to the values in □

B. Governor Settings

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control Control rod travel rev/min mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	
ca. 54	1500	16,0	without auxiliary spring	ca. 17	350	8,8	1480	0	450 1,2-1,8
	1550	10,4			200	20,5-21,0			
	1580	7,0			350	8,5- 9,1			
ca. 52 2a	1500	ca. 11,6	with auxiliary spring	ca. 17	550	1,2- 5,0			720 0 - 1,0
	1550	ca. 6,5			720	0 - 1,0			
	1700	0,3-1,0							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	6 Rotational-speed limitat		3a Fuel delivery characteristics		Starting fuel delivery		5 Idle stop Control rod travel mm
	rev/min	cm³/1000 strokes	Note changed to .. rev/min	rev/min	cm³/1000 strokes	rev/min	
1480	38,5-40,5	1500-1510	500	29,8-32,3	100	min. 20mmRW	350 cm³/1000 strokes

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.77

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Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 LANM 2,7 b

2. Edition

En

PES 4 M 65 B 420/3 LS 42

EP/RSV 400-1200 M2B 316 DR
B 308) *
B 312)

supersedes
company
engine

John Deere/Lanz
Schlepper T 700
M 405/48 PS

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7				
	9	1,5-2,3				
200	9	0,5-1,3				
	20	5,0-6,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

EP/RSV 400-1200 M 2 B 316 DR

① Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca.44	1200	16	without auxiliary spring	ca.19	400	7,5	1150	0	1000	0,8-1,0
	1240	12			150	20,5-21	900	1,2-1,4		
②a	1280	8,4	with auxiliary spring		400	7,2-7,8	500	1,2-1,4	500	1,2-1,4
	1260	8 -10,8			500	5,1-6,2	600	2 -4,6		
	1300	4,8- 6,5			600	2 -4,6	700	0 -2,7	0	0
	1380	1 - 3,5			700	0 -2,7	800	0 - 1		
	1460	0,3- 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp 40°C (104°F) rev/min	cm³/1000 strokes	⑥ Rotational-speed limitat Note changed to rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle rev/min	⑤ cm³/1000 strokes	④a Idle stop Control rod travel mm
			4	5 cm³/1000 strokes			
1180	39,5-41,5		800	44,0-47,0			400 7,5
			500	43,0-46,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

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The numbers denote the sequence of the tests

B. Governor Settings

LANM 2,7 b

-2-

(1A)

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.44	1200 1240 1290	16 11,8 5,5	without auxiliary spring			ca.19	400 150 400 500 600 700	7,5 20,5-21 7,2-7,8 3,1-5 0 -2,2 0 -1		
(5)	1250 1300 1360 1500	9 -11,5 4,4- 6 1,8- 3,8 0,3- 1								

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitation	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)	rev/min cm³/-1000 strokes	Note: changed to ...) rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1180	41,0-43,0				100	mind.20mmRW	400	7,5

Checking values in brackets

*1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure (g.p.)

Pump/governor	Setting (g.p.)	Measurement bar (g.p.)	Control rod travel-diminution difference mm (1)

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 LANM 2,7 a

2. Edition

En

PES 4 M 60 A 420/3 LS 36 EP/RSV 400/-1200 M 2 B 308
B 312

supersedes
company
engine

6.63
John Deere-Lanz
700

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 12

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,5-3,0				
	9	1,0-1,7				
200	9	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm
1	2	3	7	8	9	10
ca.44	1200	16	without auxiliary spring	ca.19	400	7
	1240	11,8			150	20,5-21
2a	1290	5,5			340	11,6-14,8
	1240	10,8-12,6			400	7,5
	1280	6 - 8,4	with auxiliary spring		550	1,3- 3,6
	1400	0,8- 3,4			700	0 - 1
	1500	0,3- 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp. 40°C (104°F)	6	Rotational-speed limitat Note: changed to ... rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	rev/min	4	cm³/1000 strokes	6	7	8	9
1180	42,5-43,5							400	7

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.65

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Test Specifications

Fuel Injection Pumps ①A

and Governors

40

VDT-WPP 001/4 REN 2,0 a

1. Edition

En

PES 3 M 65 B 320 RS 38 EP/RSV 275-1000 M5 B 315 D
F-PES 3 M 65 A 320 RS10F1 F-EP/RSV 275-1000 M4/1 F1d

supersedes:
company
engine
Renault
587

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 21

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,3-3,7	0,3			
	9	1,5-2,3				
	18	6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in □

B. Governor Settings

M5 B315D -

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm
1	2	3	7	8	9	10
ca.43	1000	16	ca.18	275	8	980 0
	1040	12,2		150	19 -21	800 0,4-0,6
	1080	7,4		275	7,7-8,3	600 1,1-1,3
2a	1080	6,5-9,2		500	3 -5,5	
	1200	1,3-3,8		800	0 - 1	
	1300	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp 40°C (104°F)	6	Rotational-speed limitat Note changed to 1 rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	rev/min	4	cm³/1000 strokes	rev/min	7	8	9
980	34,3-36,3	1010-1030	750 600	37,8-40,8 39,8-42,8					

Checking values in brackets

* 1 mm less control rod travel than col 2

11.64

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The numbers denote the sequence of the tests

B. Governor Settings

M4/1F1d Control lever vertical = scale 30°

① Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees	Lower rated speed rev/min		③ Torque control Control rod travel	③ Torque control Control rod travel
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		8	9		
ca.30	1000	16	without auxiliary spring	ca.9	275	8	980	0	850	0,5-0,6 1 -1,2
	1070	10			100	19 - 21	275	7,7-8,3		
2a	1130	2	with auxiliary spring		400	5,1-6,5	550	2 -4,4	600	
	1070	8,8-11,2			800	0 - 1				
1125	4,4-7									
	1200	1,5-4,5								
1345	0 - 1									

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)	⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤	④a Idle stop Control rod travel	
	rev/min	cm³/1000 strokes	Note: changed to ...) rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
	1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n =

rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel-difference (1)
	Gauge pressure = bar	Gauge pressure = bar	mm	

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

Test Specifications Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 LANM 1,2 a

2. Edition

En

PES 2 M 60/320/3 RS 13

EP/RSV 250-1250 M 1/4 D
EP/RSV 250-1250 M 1/13D ./. .

supersedes
company
engine

1.65
Johne-Deere-Lanz
LXA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 18 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,5-3,0				
	9	1,0-1,7				
	18	5,3-6,3				
200	9	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

..M1/4D Control lever vertical = scale 30°

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm
ca. 37	1250	16	without auxiliary spring	ca. 8	250	7,5
	1280	12			150	20,5-21
	1310	8,2			220	8,6-21
2a	1300	7,2-10,6	with auxiliary spring		500	2,2-5,2
	1400	1,6- 3			750	0 - 1
	1540	0,3- 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop	6	3a	Starting fuel delivery Idle	5	4a
Test oil temp. 40°C (104°F)	rev/min cm³/1000 strokes	Note changed to 1 rev/min	Fuel delivery characteristics	rev/min cm³/1000 strokes	rev/min cm³/1000 strokes	Idle stop Control rod travel mm
1230	31,5-33,5	1260	1000 700	32,0-35,0 32,0-35,0		

Checking values in brackets

* 1 mm less control rod travel than col 2

6.67

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The numbers denote the sequence of the tests

..M1/13D Control lever vertical = scale 30°

B. Governor Settings

Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			Control-lever deflection in degrees 7	Lower rated speed		Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 42	1250	16,0	without auxiliary spring	ca. 11	250	8,0	1120	0	1120	0
	1280	13,2			150	20,5-21				
2a	1320	9,2	with auxiliary spring		250	7,7-8,3	1000	0,1-0,3	1000	0,1-0,3
	1320	7,4-10,5			400	5,2-6,6				
	1380	4,3-6,4			500	2,2-5,2	900	0,2-0,4	900	0,2-0,4
	1450	0,6-3,8			600	0 - 3,5				
	1550	0 - 1,0			750	0 - 1				

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat. Note: changed to ... rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop Control rod travel mm
1	2	3	4	5	6	7	8	9
1230	34,3-36,3	1260	900 500	35,5-38,5 35,5-38,5				

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure CompensatorTest at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel diminution difference (1)
	Gauge pressure = bar	Gauge pressure = bar	mm	

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 IHC 2,2 l (2,2 m)
2. Edition

En

PES 4 A 60 B 420 LS 105
LS 105 R

EP/RSV 250-950 A 4/42 D

supersedes 2.62
company IHC
engine DD 132 S
DD 132

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestrike 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,5-5,0	0,3			
	6	0,5-1,2				
	18	8,3-9,1				
200	6	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in []

Testoil-ISO 4113

B. Governor Settings

1	Upper rated speed rev/min		Intermediate rated speed			4	Lower rated speed		3	Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min
1	2	3	4	5	6	7	8	9	10	11	
ca.54	950	14	without auxiliary spring	ca.22	250	5,8	930	0	800 0,3-0,5	600 0,6-0,8	300 0,6-0,8
	980	10			100	19 - 21					
	1010	5			250	5,5-6,1					
2a	980	8 - 11	with auxiliary spring		350	3 - 4,5					
	1000	4,8- 8			450	0 - 2,5					
	1050	1,8-3,8			550	0 - 1					
	1080	0 - 2,5									

1150 0 - 1

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp. 40°C (104°F)	6	Rotational-speed limit Note: changed to) rev/min	3a	Fuel delivery characteristics rev/min cm³/1000 strokes	Starting fuel delivery Idle rev/min	5	4a	Idle stop Control rod travel mm
1	rev/min	2	3	4	5	6	7	8	9
R	930	42,5-44,5	960	500	43,0-46,0	At n = 700 delivery must be greater than at n = 500.			
	930	29,0-31,0		700	44,0-46,5				
			960	500	29,0-32,0				
				700	31,0-33,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.64

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Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 EIC 3,9 a

1. Edition

En

PES 4 A 80 D 420 RS 1277	EP/RSV 300-1000 A1 B643D (1)	supersedes	-
RS 1277Z	B643D (2)	company	EICHNER
RS 1277	B670D (3)	engine	EDK 4-10:75PS(1)
RS 1278	B643D (1)		4- 8:65PS(2)
PES 6 A 80 D 420 RS 1280	300-1050 A1 B671D (4)		4- 9:55PS(3)
			6- 3:100PS(4)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	9	4,6-5,0	0,4			
1000	6	2,0-2,8				
200	6	0,1-0,7				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

300-1000 A1 B643 (1,2)

① Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control Control rod travel rev/min mm 10 11
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	
ca.55	1000	16,0	without auxiliary spring	ca.26	300	6,0	P.1277:	100 19-21 300 5,7-6,3 360 2,6-4,2 460 0 - 1	P.1277Z: 0 1000 0 500 0,5-0,7
	1050	11,2			100	19-21			
②a	1100	5,5	with auxiliary spring		300	5,7-6,3			
	1070	7,0-10,2			360	2,6-4,2			
	1120	1,2- 5,0			460	0 - 1			
	1200	0 - 1							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp 40°C (104°F)	⑥ Rotational-speed limitat		③a Fuel delivery characteristics			Starting fuel delivery Idle rev/min	⑤	④a Idle stop Control rod travel mm
	rev/min	cm³/1000 strokes	Note changed to ..	rev/min	cm³/1000 strokes			
(1) 1000	62,0-64,0		1020	500	54,0-57,0	100	16,0-16,6	
(2) 1000	52,0-54,0			800	51,5-54,5			
				500	49,0-52,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

4.73

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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm
1	2	3	2a	4	5	6	4	7	8	9	3	10	11
ca.55	1000	16,0					4	ca.26	300	6,0		980	0
	1050	11,6		without spring	auxiliary				100	19-21			
	1100	5,6							300	5,7-6,3			
	1080	6,0-9,5		with auxiliary					370	2,0-3,7			
	1120	1,5-5,4		spring					460	0 - 1			
	1180	0 - 1						3a					

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)			Rotational-speed limitation intermediate speed (2b)		Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery Idle switching point (6)		Torque-control travel (5)			
rev/min	cm³/1000 strokes	1	rev/min	4a	rev/min	cm³/1000 strokes	6	rev/min	cm³/1000 strokes	8	Control rod travel mm	9
1	2	3			4	5		6	7			
(3)	1000	44,5-46,5		1020		800 500	42,0-45,0 41,5-44,5	100	16,5-17,1			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113**B. Governor Settings**

300-1050 A1 B671D (4)

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm
1	2	3	2a	4	5	6	4	7	8	9	3	10	11
ca.60	1050	16,0					4	ca.28	300	6,0		1050	0
	1100	12,0		without spring	auxiliary				100	19-21			
	1160	5,6							300	5,7-6,3			
ca.58	1070	ca.9,0		with auxiliary					450	1,5-3,7			
	1150	ca.3,5		spring					600	0 - 1			
	1220	0 - 1						3a					

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)			Rotational-speed limitation intermediate speed (2b)		Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery Idle switching point (6)		Torque-control travel (5)			
rev/min	cm³/1000 strokes	1	rev/min	4a	rev/min	cm³/1000 strokes	6	rev/min	cm³/1000 strokes	8	Control rod travel mm	9
1	2	3			4	5		6	7			
(4)	1050	54,0-56,0		1070		800 500	52,0-55,0 48,0-51,0	100	16,5-17,1			

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 FOR 2,4 a

3. Edition

PES 4 M 70 C 321 RS 52 EP/RSV 500-1500 MOB 335R En

500-1800
300-1800 MOB 338DR
300-1800 MOB 343DR

supersedes
company
engine

-
Ford
York

PES 4 M 70 C 321 RS 54 EP/RSV 300-1800 MOB 333DR

PES 4 M 70 C 321 RS 55 EP/RSV 300-1800 MOB 333DR

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,7 + 0,1 mm (from BDC) RW21

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,5-5,0	0,3			
	9	2,7-3,5				
	15	8,1-9,1				
200	9	1,3-2,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm	Control rod travel mm rev/min	Intermediate rated speed 4	5	6	④ Lower rated speed Control lever deflection in degrees 7	rev/min	Control rod travel mm	③ Torque control Control rod travel rev/min	10	11
②a	See page 2										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F) rev/min	⑥ Rotational-speed limitat Note changed to) rev/min	③a Fuel delivery characteristics rev/min	Starting fuel delivery Idle rev/min	⑤ Idle stop Control rod travel rev/min				
1	2	3	4	5	6	7	8	9
See page 3								

Checking values in brackets

* 1 mm less control rod travel than col 2

8.77

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Governor Settings EP/RSV

FOR 2,4 a

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Torque-control travel rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

Testoil-ISO 4113

500-1500MO B	335					ca.21	500	7,3	1480	0
ca.49	1500	16,0					250	20,5-21		
	1560	10,9	*	without auxiliary spring			500	7,0-7,6	700	0
	1620	6,9					650	2,3-4,2	500	0,6-0,8
ca.47	1500	ca.9,5					840	0 - 1		
	1530	ca.4,7	** with auxiliary spring							
	1650	0,3-1,0								

500-1800MO B 335

ca.68	1800	16,0				ca.26	500	7,3	1480	0
	1860	12,6	*				250	20,5-21		
	1950	6,6					500	7,0-7,6	700	0
ca.64	1800	ca.49,8					650	3,1-4,7	500	0,6-0,8
	1900	ca. 4,4	**				780	0 - 1		
	2000	0,3-1,0								

300-1800MO B 333 D - Pe .S54

ca.54	1800	12,0				ca.14	380	5,5	1780	0
	1940	9,0	*				100	20,5-21		
	2100	4,6					300	7,2-8,6	1200	0,3-0,5
ca.51	1830	9,2-9,6					380	5,3-5,8	500	1,0-1,2
	2000	4,0-4,9	**				700	2,1-4,2		
	2300	0,3-1,0					1100	0 - 1		
	300-1800MO B	333 D	- Pe	.S55		ca.20	380	5,5		
ca.66	1800	12,0					100	20,5-21	1780	0
	2000	8,8	*				300	7,6-8,4		
	2200	4,8					380	5,2-5,8	1200	0,3-0,5

ca.58	1830	8,4-8,6					700	2,4-4,3	500	1,0-1,2
	2000	4,1-5,0	**				1140	0 - 1		
	2300	0,3-1,0								
	300-1800 MO B	338 D				ca.20	380	5,5		
ca.67	1800	12,0					100	20,5-21	1800	0
	2000	9,0	*				300	7,5-8,6	1200	0,4-0,6
	2200	6,9					380	5,2-5,8		
ca.60	1800	ca.9,2					800	1,0-3,6	500	1,1-1,3
	2000	ca.5,4	**				1160	0 - 1		
	2280	0,3-1,0								

ca.50	1820	10,0				ca.22	380	7,0		
	1860	8,0	*				100	20,5-21	1800	0
	1920	4,6					300	7,7-8,6	1000	0,8-1,0
	1820	9,4-10,6					380	5,9-7,1		
	1960	2,8- 4,1	**				800	1,4-3,1	400	1,1-1,3
	2120	0,3- 1,0					1060	0 - 1		

Note: Tightening torque of delivery-valve holder 0-2.5-0.5-0-2.8+0.2 m kp
 Cam sequence and angular cam spacing 1-2-4-3 90° in each case; test with overflow valve

Testoil-ISO 4113**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery Test oil temp 40°C (104°F)		Rotational-speed limitation Control-rod stop	RQV RQ	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	
1	2	3	4	5	6	7	
*	.52 **	500-1500 MO B335:			100	mind. 94,5	
1500	39,0-41,0	1530: 0,5-1,5 mmRW			500	12,5-16,5	
		***			1570	3,5-5,5 mmRW	
*	.52 **	500-1800 MO B335:			100	mind. 94,5	
1800	39,0-41,0	1830: 0,5-1,5 mmRW			500	12,5-16,5	
		***			1880	3,5-5,5 mmRW	
*	.52 **	300-1800 MO B338D:			100	mind. 94,5	
1800	37,5-39,5	1825-1835	1000	36,0-39,0	300	5,5 - 9,5	
			500	29,0-32,0	2000	4,3 - 4,8 mmRW	
*	.52 **	300-1800 MO B343D:			100	mind. 94,5	
1800	39,0-41,0	1830-1840: 1 mmRW	1000	37,0-40,0	300	12,5-16,5	
		***	500	30,0-33,0	1910	max. 14,5	
*	.54 **	300-1800 MO B333D:			100	mind. 94,5	
1800	37,5-39,5	1825-1835	1000	36,0-39,0	300	14,5-16,5	
			500	29,0-32,0	2000	4,3-4,8 mmRW	
*	.55 **	300-1800 MO B333D:			100	mind. 94,5	
1800	31,5-33,5	1825-1835	1000	32,5-35,5	300	14,5-16,5	
					2000	4,3-4,8 mmRW	

* pump

** with governors

*** less than
column 2

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 IHC 1,8 k

2. Edition

En

PES 3 M 65 A 320/3 LS 35 Y EP/RSV 250-.. M 1 A 110 D
 LS 35 X A 112 D
 LS 35 W A 113 D
 LS 35 W A 115 D

supersedes 12.64
 company IHC
 engine DD 99
 DD 111

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7	0,3			
	9	1,5-2,3				
	18	6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

250-750 M 1 A 110 D

① Upper rated speed rev/min	Intermediate rated speed			④ Lower rated speed	Torque control				
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	7	8	9	10	11	
ca. 45	750	16	without auxiliary spring	ca. 26	250	9	730	0	
	800	12			100	19-19,5	500	0,4-0,6	
	830	8,6			250	8,7-9,3	400	5 - 7	
②a	820	8,5-11,5	with auxiliary spring		500	0,5-5	700	0 - 1	
	900	4 - 6,4			700	0 - 1			
X 1050	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)	⑥ Rotational-speed limitat Note changed to rev/min	③a Fuel delivery characteristics	Starting fuel delivery Idle	⑤	④a Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min
1	2	3	4	5	6
X 730	32,5-34,5	760	500	34,5-37,5	

Checking values in brackets

* 1 mm less control rod travel than col 2

3.65

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B. Governor Settings

250-750 M 1 A 112 D IHC 1,8 k

-2-
1

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel		
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	1
1	2	3	2a	4	5	6	7	8	9	10	11
ca.44	750	16					ca.26	250	9,6	730	0
	800	11,8	without spring	auxiliary				100	19-19,5		
	820	9,6						250	9,3- 9,9	500	0,4-0,6
	800	10,6-12,6						400	5,8- 7,8		
	900	4 - 6,5	with auxiliary spring					500	1,5- 5,8		
	1050	0 - 1					(3a)	700	0 - 1		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	5a	5b	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10
W 730	36,5-38,5		760	500	39,5-41,5				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

250-900 M 1 A 110 D

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel		
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	1
1	2	3	2a	4	5	6	7	8	9	10	11
ca.51	900	16					ca.26	250	9	800	0
	950	12,4	without spring	auxiliary				100	19-19,5	700	0,3-0,5
	990	8						250	8,7- 9,3		
	980	7,5-10,5						400	5 - 7		
	1050	3,5- 6	with auxiliary spring					500	0,5- 5	500	0,8-1,0
	1200	0 - 1					(3a)	700	0 - 1		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	5a	5b	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10
X 880	31,5-33,5		910	500	35,5-37,5				
				700	33,0-35,0				

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

D11

D11

B. Governor Settings

250-900 M 1 A 113 D IHC 1,8 k -3- 1

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	rev/min	mm
1	2	3	②a	4	5	6	④	7	8	9	③	10	11
ca.50	900	16						ca.25	250	9,6			
	950	11,8		without auxiliary					100	19-19,5	880	0	
	980	8,6		spring					250	9,3- 9,9	700	0,2-0,4	
	950	10,5-12,6							400	5,5- 7,6	500	0,6-0,8	
	1000	6,5- 8,4		with auxiliary					500	1 - 5,8			
	1200	0 - 1		spring					700	0 - 1			
							③a						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤b			Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤		
rev/min	cm³/1000 strokes	rev/min	rev/min	④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm	rev/min	mm
1	2	3	4	④a	5	6	6	7	8	9	8	9
W 880	36,5-38,5	910	500		39,5-41,5							
			700		37,5-39,5							

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

250-1000 M 1 A 110 D, 115 D*

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	rev/min	mm
1	2	3	②a	4	5	6	④	7	8	9	③	10	11
ca.54	1000	16						ca.25	250	9			
	1050	11		without auxiliary					100	19-19,5	980	0	
	1070	8,4		spring					250	8,7- 9,3	700	0,7-0,9	
	1060	8-11							400	5 - 7	500	1,0-1,2	
	1100	5-7		with auxiliary					500	0 - 5			
	1150	1,8-4,6		spring					700	0 - 1			
	1250	0 - 1					③a						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤b			Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤		
rev/min	cm³/1000 strokes	rev/min	rev/min	④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm	rev/min	mm
1	2	3	4	④a	5	6	6	7	8	9	8	9
X 980	31,5-33,5	1010	500		35,5-37,5			*	100	1 mm control-rod travel more than at n = 500		
			700		33,0-35,0							

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

D12

D12

The numbers denote the sequence of the tests

250-1000 M 1 A 112 D

B. Governor Settings

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm		10	11
ca.54	1000	16	without auxiliary spring	ca.25	250	9,3	980	0	2a	100	19-19,5
	1050	11			250	9- 9,6	700	0,3-0,5		400	5,2- 7,4
2a	1070	8,6	with auxiliary spring		400	5,2- 7,4	500	0,7-0,9		500	0,8- 5,4
	1050	10-12			700	0 - 1					
	1100	5,5-7,8									
	1150	2,2-5,4									
	1250	0 - 1									

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat.	3a Fuel delivery characteristics		Starting fuel delivery		5	4a Idle stop	
rev/min	cm³/1000 strokes	Note: changed to ... rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	idle	rev/min	control rod travel mm
Y 980	36,0-38,0	1010	500 800	39,5-41,5 36,5-38,5					

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting	Measurement		Control rod travel-difference
	Gauge pressure = bar	Gauge pressure = bar	mm	(1)

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel);

En

Test Specifications Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 LAN 2,4 c

2. Edition

En

PES 4 M 60 A 320/3 LS 32
A 420/3 LS 32

EP/RSV 400-1200 M 2 B 306 D
311 D
400-1000 M 2 B 303 D
310 D
375-1250 M 2 B 116 D

supersedes:
company
engine

11.64
John-Deere-Lanz
401
500

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,5-3,0	0,3			
	9	1,0-1,7				
	18	5,3-6,3				
200	9	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

EP/RSV 400-1200 M 2 B..D

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3				7	8	9	10	11
ca.44	1200	16	without auxiliary spring	ca.19	400	7,5	1180	0	0	0
	1240	11,8					150	20,5-21	1000	0,2-0,4
	1280	6,7					400	7,3-7,7	800	0,5-0,7
	1240 10,8-12,6		with auxiliary spring	ca.19	600	2,2-4,6	500	0,5-0,7	0	0
	1280	6 - 8,4					800	0 - 1		
	1400	0,8- 3,4								
	1500	0 - 1								
2a										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	6 Rotational-speed limitat Note: changed to) rev/min	3a Fuel delivery characteristics	Starting fuel delivery Idle	5 Idle stop
rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min
1	2	3	4	5
1180	35,5-37,5	1210-1230	1000 700 500	36,5-39,0 36,5-39,0 34,0-37,0
				400
				7,5

Checking values in brackets

* 1 mm less control rod travel than col. 2

8.69

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D14

Testoil-ISO 4113

B. Governor Settings

EP/RSV 400-1000 M 2 B..D LAN 2,4 c

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	rev/min	mm
1	2	3	②a	4	5	6	④	7	8	9	③	10	11
ca.34	980	16						ca.16	400	7,5		960	0
	1010	12		without auxiliary					150	20,5-21			
	1040	7	spring						400	7,2-7,8		820	0,6-0,8
	1040	6,3-8,5							500	5 - 6			
	1120	2,8-4,6	with auxiliary						650	0 - 3,4		550	0,6-0,8
	1250	0,3- 1	spring						800	0 - 1			
							③a						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed			Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	②	rev/min	②b	rev/min	cm³/1000 strokes	⑤a	rev/min	cm³/1000 strokes	⑥	rev/min	Control rod travel mm
1	2	③	4	④a	5	6	⑤b	7	8	⑥	8	9
960	31,7-33,7	980-995			900	32,7-35,2					400	7,5
					700	33,0-35,5						
					500	31,0-34,0						

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testail-ISO 4113

B. Governor Settings

EP/RSV 375-1250 M 2 B 116 D

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	rev/min	mm
1	2	3	②a	4	5	6	④	7	8	9	③	10	11
ca.43	1250	16						ca.17	375	8		1230	0
	1280	11,8		without auxiliary					150	20,5-21		1100	0,1-0,3
	1310	7,6	spring						375	7,7-8,3		900	0,6-0,8
	1300	7,2-10,4							600	1,8-4,8		500	0,7-0,9
	1400	1,8- 4,2	with auxiliary						800	0 - 1,0			
	1500	0,3- 1,0	spring					③a					

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed			Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	②	rev/min	②b	rev/min	cm³/1000 strokes	⑤a	rev/min	cm³/1000 strokes	⑥	rev/min	Control rod travel mm
1	2	③	4	④a	5	6	⑤b	7	8	⑥	8	9
1230	35,5-37,5	1260-1270			800	37,0-40,0						
					400	34,0-38,0						

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 SAV 2,2 a

1. Edition

En

PES 3 M 65 C 320 RS 38 (B)	EP/RSV 275-1000 M5 B325D (1) EP/RSV 275-1075 M5 B325D (2) EP/RSV 250-1250 M5 B323D (3) EP/RSV 350-1250 M8 B340 (4) EP/RSV 275-1075 M5 B326D (5)	supersedes company engine	REN 2,3 b 1.68 SAVIEM 715-30 (1-2,2) 715-30 (2-2,2) 592-50 (3-2,3) 714-52 (4-2,5) 714-30 (5-2,5)
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All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

/ RW 21

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	3,3-3,7	0,3			
	9	1,5-2,3				
	18	6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

275-1000 M5 B325D (1)

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	4 Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	3 Torque control rev/min 10	Control rod travel mm 11	
ca .43	1000	16,0	without auxiliary spring.	ca .18	275	8,0	880	0	0	0	
	1050	11,6			150	20,5-21					
	1180	7,6			275	7,7-8,3					
2a	1050	10,5-12,5	with auxiliary spring		500	3,0-5,5	800	0,3-0,5	1,0-1,2	1,0-1,2	
	1150	2,5- 6,4			780	0 - 1					
1320	0 - 1										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1	6 Rotational-speed limit Note changed to) rev/min 2	3a Fuel delivery characteristics rev/min 3	Starting fuel delivery Idle rev/min 6	5	4a Idle stop Control rod travel mm 9
980	39,0-41,0	1020	750 500	42,5-45,5 44,0-47,0	100 mind. 7,4 275 1080 4,5-8,5 7,5-15,5

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.72

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B. Governor Settings

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 46	1075	16,0				ca. 18	275	8,0	1050	0
	1100	13,0	*				150	20 - 21		
	1150	7,5					275	7,7-8,3	800	0,5-0,7
	1120	10,0-12,0					500	3,0-5,5		
	1200	4,0- 6,0	**				780	0 - 1	400	1,0-1,2
	1380	0 - 1								
ca. 60	1275	16,0				ca. 22	250	8,5		
	1320	13,0	*				150	19 - 21	1260	0
	1380	8,2					250	8,2-8,8		
	1380	7,0-9,5					500	3,5-6,0	1000	0,4-0,6
	1500	1,8-4,6	**				800	0 - 1	400	0,9-1,1
	1650	0 - 1								
ca. 62	1250	16,0				ca. 22	350	8,0		
	1300	11,2	*				200	20,5-21	1250	0
	1340	7,0					350	7,7-8,3		
	1300	10,5-12,0					500	2,1-4,5	600	0
	1400	2,9- 4,8	**				680	0 - 1	400	1,2-1,8
	1540	0 - 1								
ca. 46	1075	16,0				ca. 18	275	8,0		
	1100	11,2	*				150	20,5-21	1060	0
	1150	7,0					275	7,7-8,3	800	0,3-0,5
	1120	10,0-12,0					450	4,4-6,2		
	1200	4,8- 6,4	**				760	0 - 1	400	0,3-0,5
	1380	0 - 1								

275-1075 M5 B325D (2) 250-1250 M5 B323D (3) 350-1250 M8 B340 (4) 275-1075 M5 B326D (5)

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		2	Rotational-speed limitation intermediate speed	2b	Fuel delivery characteristics high idle speed	5a	Starting fuel delivery idle switching point	6	5
rev/min	cm³/1000 strokes		rev/min	4b	rev/min	5b	rev/min	cm³/1000 strokes	Idle stop High idle speed rev/min cm³/1000 strokes
1	2	3	3	4	5	6	7	8	9
1060 (2)	40,0-42,0		1100:0,5-1,0 ****	750	43,0-46,0	100	ca.20 mm RW	275	3,5-7,5
1260 (3)	38,0-40,0		1280	500	44,0-47,0	100	mind.7,9	250	3,5-7,5
				750	39,5-42,5				
				500	39,0-42,0		***	1300	7-10mmRW
1250 (4)	49,0-51,0		1270:0,5-1,0 ****	600	45,0-48,0	100	ca.20 mmRW	350	4,5-8,5
1060 (5)	49,5-51,5		1100:0,5-1,0 ****	750	48,5-51,5	100	mind.7,4	275	4,5-8,5
				500	48,0-51,0		***		
								1150	17,5-25,5

When checking (column 2 and 5) increase by $\pm 0.5 \text{ cm}^3/100\text{h}$

* without auxiliary spring

*** Control lever vertical

** with auxiliary spring

**** less than column 2!

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 SAV 2,7 a

1. Edition

En

PES 4 M 65 C 320 RS 38
(B)

EP/RSV 275-1250 M1 B321D (1)
EP/RSV 300-1250 M1 B330D (2)
EP/RSV 300-1400 M1 B332 (3)
EP/RSV 300-750 M7 B339 (4)

supersedes -
company Saviem
engine 598-30 (1-2,7)
598-30 (2-2,9)
712-70 (3-3,3)
712-50 (4-3,3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 21!

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	12	3,3-3,7	0,3			
	9	1,5-2,3				
	18	6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

275-1250 M1 B321D (1)

① Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees	Lower rated speed		③ Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca.65	1275	12,0	without auxiliary spring	ca.23	275	7,3	1260	0	1000	0,7-0,9
	1300	9,0			100	20,5-21				
	1315	6,5			275	7,0-7,6				
②a	1275	11,6-12,4	with auxiliary spring		450	1,6-4,5	500	1,0-1,2		
	1300	7,5-9,5			620	0 - 1				
	1440	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp 40°C (104°F)	⑥ Rotational-speed limitat		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤		④a Idle stop CM³/1000 Control rod travel mm	
	rev/min	cm³/1000 strokes	Note changed to) rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min
	1	2	3	4	5	6	7	8	9	
1260	38,0-40,0		1280	1000	39,0-42,0	100	mind.7,9	275	3,5-7,5	
				750	39,5-42,5					High idle speed
				500	39,0-42,0					
								1300	7-10 mm RW	

Checking values in brackets

* 1 mm less control rod travel than col 2

12.72

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B. Governor Settings

EP/RSV ..

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm		
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	mm				
ca.65 09.57 2a	1270	12,0	**	***	ca.22	300	7,3	1260	0	1,0-1,2		
	1310	6,6				200	20,5-21					
	1270	11,5-12,5				300	7,0-7,6	1000	0,7-0,9	1,0-1,2		
	1350	2,0-3,5				450	2,1-4,6					
	1450	0 - 1			ca.21	620	0 - 1	500	1,0-1,2	0		
	1400	16,0	**			300	8,0	1400				
	1480	10,6	150			20,5-21,0						
	1530	6,0	300			7,7-8,3	500					

C. Settings for Fuel Injection Pump with Fitted Governor

2b Test oil temp. 40°C (104°F)	Full-load stop		6 Rotational-speed limitat. Note: changed to ...) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle	5 rev/min	4a Idle stop	
	rev/min	cm³/1000 strokes		4	5 cm³/1000 strokes			8 rev/min	9 Control rod travel mm
(2)	1260	38,0-40,0	1280	1000	39,0-42,0	100	ca.21 mm RW	300	3,5-7,5
				750	39,5-42,5			1300	7-10mmRW
(3)	1400	48,5-50,5	1430	600	43,0-46,0	100	mind.7,4	300	7,5-11,5
(4)	750	46,5-48,5	770	600	46,0-49,0	100	ca.20 mm RW	300	7,5-11,5

Checking values in brackets

When checking (column 2 and 5) increase by $\pm 0.5 \text{ cm}^3/100\text{h}$

* 1 mm less control rod travel than col. 2

B. Governor Settings

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	mm		
ca.57	1460	11,0-12,6	***	ca.21	450	2,6-5,2	350	1,2-1,8	0 - 1	1,2-1,8
	1550	3,9- 6,3			680	0 - 1				
	1660	0 - 1								
ca.44 2a	750	16,0	**	ca.22	300	8,5	730	0	1,2-1,8	0
	770	11,6			200	19 - 21				
	790	6,4			300	8,2-8,8				
	775	9,2-11,3			400	2,6-5,2				

825 3,8- 5,2 mit Zusatz-
925 0 - 1 federn

540 0 - 1 340 1,2-1,8

300-1250 M1 B330D (2) 300-1400 M2 B332 (3) 300-750 M7 B339 (4)

** without auxiliary spring

*** with auxiliary spring

① **Test Specifications
Fuel Injection Pumps ①
and Governors**

40

WPP 001/4

1. Edition

En

PES 4 M 50/320 LS 6

EP/RSV 250-1200 M 1/5 d

supersedes

company:

engine:

Lans
75 CD

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 + 0,1

mm (from BDC)

RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	1,8-2,4	0,2			
	9	0,8-1,2				
	18	3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed Degree of deflection of control lever 1	rev/min	Control rod travel mm	1a 2a	Intermediate rated speed			Degree of deflection of control lever 7	rev/min	Control rod travel mm	3	Sliding sleeve travel 1 rev/min mm
				4	5	6					
ca. 40	1200	16					ca. 11	250	8		
	1240	12,6		without	auxiliary			100	19-21	1180	0
	1280	7,8		spring				250	7,7-8,3	900	0,5-0,7
	1280	6-9						400	5,3-6,6	600	1,2-1,4
	1320	4-6		with auxiliary				600	0 - 3,7	300	1,6-1,8
	1380	1,4-3,8		spring				750	0 - 1		
	1500	0 - 1									

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 3		Fuel delivery characteristics high idle speed 5a		Starting fuel delivery idle switching point 6		Torque-control travel Control rod travel mm 5	
rev/min	cm³/1000 strokes	rev/min	4	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1180	31,7-33,7	1210-1230	900 400	33,7-36,7 33,7-36,7					

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.61

Test Specifications

Fuel Injection Pumps 1A and Governors

40

WPP 001/4

1. Edition

En

PES 2 M 65/420 L 2

EP/RSV 700-2500 M 6/3 d

supersedes
company
engine

-
Lanz
BP 201

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7	0,2			
	9	1,4-2,1				
	18	6,7-7,5				
200	9	0,6-1,2				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm
1	2	3	7	8	9	10
ca. 49	2500	8	without auxiliary spring	ca. 10	750	7,5
	2580	6,4			300	19-21
	2660	2,8			700	7,2-7,8
2a	2500	7,8-8,4	with auxiliary spring		900	4,4-5,8
	2600	3,8-5,6			1100	0,4-3,8
	2700	1,2-2,6			1400	0 - 1
	2850	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp. 40°C (104°F)	6	Rotational-speed limitat Note: changed to) rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	rev/min	4	cm³/1000 strokes	6	7	8	9
2480	19,5-20,5	2510-2530	1000 1600	1000 1600	28,0-30,0 31,0-33,0	200	mind.5,9		
			700	ca. 6,5	dispersion max. 10cm³				

Checking values in brackets

* 1 mm less control rod travel than col 2

5.61

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Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 MWM 2,7 a

1. Edition

En

PES 4 A 65 ^B
_C 320/3 RS1068 EP/RSV 300-1250 A2B398d

supersedes -
 company MWM
 engine KD/AKD 110,5 V

Special features:
 Top stop screw is set to stop setting.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,45 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,3-4,7	0,3			
	9	2,0-2,6				
	18	8,2-9,1				
200	9	1,4-2,1				

Adjust the fuel delivery from each outlet according to the values in □

B. Governor Settings

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel mm	Control rod travel mm
1	2	3	7	8	9	10
ca.48	1250	16	ca.19	300	6	1230
	1300	11,8		100	19-21	1100
2a	1350	6,8		200	10-21	1000
	1350	4,6-8,2		300	5,8-6,2	400
	1420	1,5-3,5		500	1,6-3,8	1,4-1,6
	1550	0,3-1		700	0 - 1	

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp. 40°C (104°F)	6	Rotational-speed limita Note. changed to) rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	4	5	rev/min cm³/1000 strokes	6	7	8	9
1230	38,0-39,0	1270	1000 600	36,5-38,5 38,0-41,0	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

6.63

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D23

Test Specifications

Fuel Injection Pumps **1A**

and Governors

40

VDT-WPP 001/4 IHC 2,2 k 1

2. Edition

En

PES 4 A 60 B 420 LS 105

EP/RSV 250-1200 A 1 A 18

supersedes 7.60
company IHC
engine DD 132

Special features: Regulator A 1 must be converted
into A 2 (IHC 2.2 k 2) during repairs.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **1,7 + 0,1** mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,5-5,0	0,3			
	6	0,5-1,2				
	18	8,3-9,1				
200	6	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm rev/min	Control rod travel mm	Control rod travel mm
1	2	3	7	8	9	10
ca.58	1200	16	ca.20	250	5,5	1180 0
	1220	12,4		100	19-21	400 0
	1250	7		250	5,2-5,8	290 1,2-1,8
2a	1230	9-12		300	3 - 4	
	1250	4-8,4		350	0 - 2,5	
	1300	0,3-2,2		450	0 - 1	
	1360	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp. 40°C (104°F)	6	Rotational-speed limitat Note: changed to ..) rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
1	rev/min	2	3	4	5	6	7	8	9
1180	32,5-34,5	1210							

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.64

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Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 IHC 2,2 q 1

2. Edition

En

PES 4 M 65 A 420 LS 35 T
LS 35 Q

EP/RSV 300-1000 M 1 B 105 D
EP/RSV 250-1200 M 2 B 121 D ./.

supersedes 10.64
company IHC
engine DD 148

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
		2	3 cm³/100 strokes				
1000	12	3,2-3,7		0,3			
	9	1,5-2,3					
	18	6,7-7,5					
200	9	0,6-1,3					

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

300-1000

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm		
ca.62	1000	16	without auxiliary spring	ca.33	300	9	980	0	0	0
	1050	12,6			100	19-19,5				
	1100	8,6			300	8,7-9,3				
	1080	9-11,4			450	5,1-7				
2a	1150	4,2-6,5	with auxiliary spring		550	1 -5,2	500	0,3-0,5	0,7-0,9	0,7-0,9
	1200	1,4-4,6			750	0 - 1				
	1300	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limitat Note changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	rev/min	cm³/1000 strokes	6	cm³/1000 strokes	8	9
980	39,5-41,5	1010	500 800	42,0-45,0 40,0-42,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

8.69

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E1

E1

The numbers denote the sequence of the tests

B. Governor Settings

250-1200

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed rev/min		3 Torque control rev/min 10	Control rod travel mm 11
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		8	9		
ca.54 2a	1200	16,0	without auxiliary spring	ca.25	250	9,0	1180	0	350	0,6-0,8 1,2-1,4
	1300	10,2			150	20,5-21		800		
	1330	8,2			250	8,7-9,3		350		
	1300	8,7-11,3	with auxiliary spring		500	4,4-6,8		350		
	1400	4,2- 6,5			880	0 - 1		350		
	1620	0 - 1						350		

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat. Note: changed to ...) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop Control rod travel mm	
rev/min	cm³/1000 strokes	rev/min	4	5 cm³/1000 strokes	6 rev/min	7 cm³/1000 strokes	8 rev/min	9	
1180	44,5-46,5	1220	700 500	47,0-50,0 48,5-51,5	100	1 mm control rod travel more than at n = 500			

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure CompensatorTest at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel-diminution difference (1)

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4 IHC 1,8 i

2. Edition

En						
PES 3 M 65 A 320/3 LS 35Y (C)	EP/RSV 250-950 M1 A108 D *				supersedes	10.64
LS 35Y	- 1400 M2 A107 D *				company	IHC
LS 35X	- 900 M1 A103 D **				engine	DD 111 *
LS 35Y	- 950 M1 B125 D*					DD 99 **

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **1,7 + 0,1** mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm³/100 strokes	Control rod travel mm	Fuel delivery	Spring pre-tensioning (torque-control valve) mm
		2	3				
1000	12	3,2-3,7		0,3			
	9	1,5-2,3					
	18	6,7-7,5					
200	9	0,6-1,3					

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

250-950 M 1 A 108 D*

① Upper rated speed rev/min Degree of deflection of control lever 1	Intermediate rated speed		④ Control-lever deflection in degrees 7	Lower rated speed rev/min	Control rod travel mm	③ Torque control rev/min	Control rod travel mm		
	Control rod travel mm	Control rod travel mm rev/min							
ca. 56	950	16	without auxiliary spring	ca. 29	250	9,5	930	0	
	1000	12			100	19-19,5			
	1030	9			250	9,2- 9,8			
②	1020	9-11,3	with auxiliary spring		400	6 - 7,8	700	0,6-0,8	
	1100	3,5- 6,2			500	2 - 6			
	1250	0 - 1			720	0 - 1			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F) rev/min	⑥ Rotational-speed limitat Note: changed to 1 rev/min	③ Fuel delivery characteristics		Starting fuel delivery Idle rev/min	⑤ Idle stop Control rod travel mm				
		1	2			4	5	6	7
930	43,0-45,0	960	500 700	43,0-46,0 41,5-44,5					

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.71

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B. Governor Settings

250-1400 M 2 A 107 D *

1

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	rev/min	mm	①
1	2	3	②a	4	5	6	④	7	8	9	③	10	11	
ca. 58	1400	16						ca. 23	250	9,5		1380	0	
	1450	12,8	without auxiliary spring						100	19-19,5				
	1500	8,8							250	9,2- 9,8		1000	0,5-0,7	
	1500	7,5-10							400	7 - 8,5				
	1600	3 - 5,5	with auxiliary spring						500	4,6- 7,2		500	1,5-1,7	
	1750	0 - 1							600	1,5- 6				
									860	0 - 1				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	②	rev/min	④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm	⑤
1	2	3	4	5	6	7	8	9	10	11	
LS35Y*			1410		500	36,0-39,0					
1380	35,5-37,5				1000	33,5-36,5					

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

250-900 M 1 A 103 D **

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	rev/min	mm	①
1	2	3	②a	4	5	6	④	7	8	9	③	10	11	
ca. 58	900	16						ca. 31	250	8,8		880	0	
	950	12,6	without auxiliary spring						100	19-19,5				
	1000	7,8							250	8,5- 9,1		700	0,3-0,5	
	980	8-10							400	5,4- 7				
	1050	4,5-6,8							500	1,2- 4,4		500	0,8-1,0	
	1100	2 - 5							700	0 - 1				
	1250	0 - 1												

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel		
rev/min	cm³/1000 strokes	②	rev/min	④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm	⑤
1	2	3	4	5	6	7	8	9	10	11	
LS35X**			910		500	34,5-37,5					
880	31,5-33,5				700	33,0-35,0					

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

Testoil-ISO 4113

The numbers denote the sequence of the tests

B. Governor Settings

250-950 M 1 B125 D*

① Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed rev/min		③ Torque control Control rod travel	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		8	9	10	11
ca.56	950	16,0	without auxiliary spring	ca.29	250	9,5	930	0	300	0,2-0,4
	1000	12,0			100	19-21				
2a	1030	8,8	with auxiliary spring		250	9,2-9,8				
	1010	10,0-12,0			400	5,9-7,6				
	1100	3,8-6,4			720	0 - 1				
	1240	0 - 1								

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limitat. Note: changed to ...) rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤	④a Idle stop Control rod travel	
rev/min	cm³/1000 strokes	3	rev/min	cm³/1000 strokes	6	7	8	rev/min	9
LS 35Y* 930	40,0-42,0		700 500	38,0-41,0 39,5-42,5					

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n =

rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel-difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

E5

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 MWM 2,0 a
Edition 3.69

En

PES 3 A 65 B320/3 RS 462, 483 EP/RSV 300-1300 A2A89D
(c) RSV049 AOA87D
EP/RSV 300-1050 AOA153D*
A0162D*

supersedes 2,0a (1.60)
company 2,0b (1.62)
engine KD 10,5 D
(35 PS / 2600)
*(28 PS / 2100) ./.
Fendt tractors

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,45 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm³/100 strokes	Control rod travel mm	Fuel delivery		Spring pre-tensioning (torque-control valve) mm
		2	3 cm³/100 strokes			2	3 cm³/100 strokes	
1	12	4,3 - 4,7		0,3				
1000	9	2,0 - 2,6						
	18	8,2 - 9,1						
200	9	1,4 - 2,1						

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

..A2A89D, ..AOA87D

① Upper rated speed rev/min Degree of deflection of control lever	Intermediate rated speed		④ Control-lever deflection in degrees	Lower rated speed		③ Torque control rev/min	Control rod travel mm	
	Control rod travel mm	Control rod travel mm rev/min		4	5	6	7	8
ca.49	1300	16,0					300	6,0
	1350	11,5					100	19 - 21
	1400	6,5					300	5,7-6,3
②a	1350	10,6-12,4	without auxiliary spring				400	4,0-5,0
	1400	4,4- 8,0					500	1,4-3,6
	1600	0 - 1	with auxiliary spring				700	0 - 1

See page 2

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)	rev/min	cm³/1000 strokes	⑥ Rotational-speed limitat Note changed to) rev/min	③a Fuel delivery characteristics rev/min	cm³/1000 strokes	Starting fuel delivery Idle rev/min	cm³/1000 strokes	⑤ Idle stop Control rod travel mm
1280	39,0 - 40,0		1320	800	41,0 - 43,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

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The nameplate described at MWM 1.5 a has recently been extended to 2 speeds and 2 deliveries - in column n = (speed) and Q = (full-load delivery) for more accurate setting in the case of governors with torque control.

The following points apply, deviating from WPP 001/4, Supplement 1, setting the governor and the pump:

(2) Setting according to nameplate n = (speed 1) and Q = (delivery 1); or according to columns 1 and 2

(3) Is contacted until change of control-rod travel, as read under (2), or (with new nameplate) until the 2 delivery is reached at speed 2; or according to columns 4 and 5

(6) Is adjusted according to nameplate n = (speed 1 + 20 rpm) or column 3

For repairs on Fendt tractors on which the new nameplate (with 2 speeds and 2 deliveries) has not yet been introduced, the full-load data apply - ordered according to engine types -

according to the above note

B. Governor Settings

..AOA153D, ..A162D*

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	9		
ca.40	1050	16,0	without auxiliary spring	ca.17	300	6,0	See page 3			
	1100	11,0			100	19 - 21				
	1150	5,6	with auxiliary spring		300	5,7-6,3				
	1100	9,5-12,0			400	5,0-6,0				
2a	1180	2,7- 4,3			500	1,2-3,6				
	1320	0 - 1			700	0 - 1				

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	6 Rotational-speed limitat. Note: changed to ...)	3a Fuel delivery characteristics	Starting fuel delivery Idle	5 Idle stop	4a Control rod travel mm
rev/min	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min
1030	33,5 - 34,5	1060	800	34,5 - 36,5	

Testoil-ISO 4113

Checking values in brackets

En

* 1 mm less control rod travel than col. 2

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

OMB 4,4 b
Edition 3.72

En

PES 4 A 85 C 410 RS 2090	RQ 250/1200 AB588DL	(1)	supersedes	1.68
PES 4 A 85 C 410 RS 2195	RQ 250/1200 AB590DL	(2)	company:	OM Brescia
PES 4 A 90 C 410 RS 2195 (D)	RQ 250/1300 AB590DL	(3)	engine:	(Büssing OM) CO 2 D(1,2)
	RQ 250/1200 AB686 L	(4)		CO 3 D(3)
	RQ 250/1300 AV686 L	(5)		C03D-Var23(4,5)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke **2,15 + 0,1** mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery "C" 8,5 Ø cm³/100 strokes	Difference "C" "D" cm³/ 100 strokes	Control rod travel mm	Fuel delivery "C" 9 Ø cm³/100 strokes	Spring pre-tensioning "D" 9 Ø mm
1	9	4,9 - 5,5	4,1-4,5	5,8-6,3	5,1-5,5	
1000	6	1,3 - 2,1	0,6-1,4	2,5-3,4	1,6-2,6	
	15	12,3 - 13,1	- - -	13,6-14,3	- - -	
200	9	3,9 - 4,4	1,4-2,2	3,8-4,6	1,9-2,9	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

250/1200 AB588DL (1)

Checking of slider PRG check Control rod travel rev/min	1	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Control rod travel rev/min	Control rod travel mm
1100	14,6-15,4	1100	15,0	1220	14,8-15,0	490	0	100	5,3-7,4	400	15,8-16,7
				1270	10,0-15,0			150	4,7-6,8	600	15,5-15,9
				1260	5,4-12,0			250	2,8-4,8	800	15,1-15,5
				1300	0 - 7,0			350	0 - 1,6	900	15,0-15,2
				1350	0			390	0		

Torque-control travel
on flyweight assembly dimension a = **0,3** mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min	Fuel delivery characteristics		Starting fuel delivery Idle speed	Control rod travel mm
rev/min	cm³/-1000 strokes	3	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm
1180	62,2 - 68,2	600	900 600	61,7 - 64,7 56,5 - 59,5	100	ca. 15 mm RW . / .

Checking values in brackets

F1

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B. Governor Settings

250/1200 AB590DL (2)

OMB 4,4 b -2- (2)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel rev/min	Control rod travel mm	Setting point		Test specifications		Control rod travel rev/min	Control rod travel mm	Setting point		Control rod travel rev/min	Control rod travel mm
		Control rod travel rev/min	Control rod travel mm	Control rod travel mm	rev/min			Control rod travel rev/min	Control rod travel mm		
1150	14,7-15,3	1150	15,0	1200	14,7-15,0	540	0	100	6,5-8,1	500	15,7-16,2
				1250	7,0-12,4			200	5,2-7,2	600	15,2-15,6
				1300	0 - 7,5			300	3,0-5,2		
				1370	0			440	0	700	15,0-15,3

Torque-control travel
on flyweight assembly dimension a = 0,3 mm

Speed regulation At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm³/-1000 strokes	rev/min	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm
1180	66,0-68,0		600	900	61,0 - 64,0	100	ca.15 mm RW
				600	58,0 - 61,0		

Checking values in brackets

B. Governor Settings

250/1300 AB 590 DL (3)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel rev/min	Control rod travel mm	Setting point		Test specifications		Control rod travel rev/min	Control rod travel mm	Setting point		Control rod travel rev/min	Control rod travel mm
		Control rod travel rev/min	Control rod travel mm	Control rod travel mm	rev/min			Control rod travel rev/min	Control rod travel mm		
1250	14,7-15,3	1250	15,0	1300	14,7-15,0	550	0	100	7,0-8,1	600	15,8-16,0
				1340	8,0-13,0			200	5,8-7,7	700	15,4-15,7
				1380	0 - 6,0			300	3,5-5,7		
				1450	0			400	0 - 2,5	800	15,0-15,2
								450	0		

Torque-control travel
on flyweight assembly dimension a = 0,3 mm

Speed regulation At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm³/-1000 strokes	rev/min	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm
1280	71,0 - 73,0		500	1000	67,0 - 70,0	100	ca.15 mm RW
				700	66,0 - 69,0		
				500	60,0 - 63,0		

En Checking values in brackets

B. Governor Settings

250/1200 AB686L (4)

OMB 4,4 b

-3-

2

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel rev/min	Control rod travel mm	Setting point		Test specifications		Control rod travel rev/min	Setting point		Test specifications		Control rod travel rev/min
		Control rod travel rev/min	Control rod travel mm	Control rod travel mm	rev/min		Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	
600	15,6-16,4	600	16,0	1200	15,7-16,0	560	0	100	6,9-8,1	-	-
				1220	15,6-16,0			200	5,7-7,7		
				1250	10,0-14,9			300	3,4-5,7		
				1300	0 - 8,3			400	0 - 2,6		
				1360	0			460	0		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm³/-1000 strokes	rev/min	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm · rev/min
1200	79,0 - 81,0	1200	800	74,5 - 77,5	100	ca. 21 mm RW	

Checking values in brackets

B. Governor Settings

250/1300 AB686L (5)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel rev/min	Control rod travel mm	Setting point		Test specifications		Control rod travel rev/min	Setting point		Test specifications		Control rod travel rev/min
		Control rod travel rev/min	Control rod travel mm	Control rod travel mm	rev/min		Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	
600	15,6-16,4	600	16,0	1300	15,7-16,0	570	0	150	6,6-8,1	-	-
				1320	15,5-16,0			200	5,7-7,9		
				1350	10,2-14,8			300	3,6-9,8		
				1400	0 - 8,5			400	0 - 2,7		
				1460	0			470	0		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm³/-1000 strokes	rev/min	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm · rev/min
1300	82,0 - 84,0	1300	800	77,0 - 81,0	100	ca. 21 mm RW	

En Checking values in brackets

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

STE 6,0 c
Edition 1.68

En

PE 6 A 80 C 412 RS 2182 RQ 250/1400 AA 322 DL (1)
 RQ 250/1500 AA 322 DL (2)
 RQ 250/1400 AB 605 DL (3)

supersedes 8.66
company: Steyr
engine: WD 609

See page 3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,5 - 6,0	0,4			
	6	2,2 - 3,0				
	15	11,5 - 12,8				
200	6	1,3 - 2,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ 250/1400 AA 322 DL (1)

Checking of slider PRG check Control rod travel rev/min 1		Full-load speed regulation Setting point Control rod travel rev/min 3				Idle speed regulation Setting point Control rod travel rev/min 7				Torque control Control rod travel rev/min 11	
		Control rod travel mm 4	Control rod travel mm 5	rev/min 6		Control rod travel mm 8	Control rod travel mm 9	rev/min 10		Control rod travel mm 12	
1300	14,4-15	1300	14,7	1400	14,4-14,7	510	0	100	6,2-8,1	450	16,0-16,3
				1420	11,0-14,7			200	4,6-6,8		
				1450	6,0-12,0			250	3,6-5,8	700	15,2-15,6
				1500	0 - 7,6			300	2,0-4,4	850	14,7-15,0
				1580	0			350	0 - 2,7		
								410	0		

Torque-control travel
on flyweight assembly dimension a = 0,4 mm + 0,05

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
rev/min 1	cm³/-1000 strokes 2	rev/min 3		rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes/mm 7		
1380	54,5 - 56,5 without		500	1000	49,5 - 52,5				
				500	45,5 - 48,5				
1380	49,0 - 52,0 with								

Checking values in brackets

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B. Governor Settings

RQ 250/1500 AA 322 DL (2)

STE 6,0 c -2-

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel rev/min	mm	Setting point		Test specifications		Control rod travel rev/min	mm	Setting point		Test specifications	
		Control rod travel rev/min	mm	Control rod travel mm	rev/min			Control rod travel mm	rev/min	Control rod travel mm	rev/min
1450	14,4-15	1450	14,7	1500	14,4-14,7	500	0	100	6,0-8,0	400	16,0-16,6
				1540	11,0-14,0			200	5,0-7,0	700	15,3-15,7
				1580	6,6-11,6			300	2,0-4,0		
				1640	0 - 8			400	0	850	14,7-15,0
				1740	0						

Torque-control travel
on flyweight assembly dimension a = 0,4 mm +0,05 Speed regulation At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min	cm³/-1000 strokes	rev/min		rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm
1480	62,5 - 64,5		500	1000	55,5 - 58,5		
1480	57,0 - 60,0			500	53,0 - 56,0		

Checking values in brackets

B. Governor Settings

RQ 250/1400 AB 605 DL (3)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel rev/min	mm	Setting point		Test specifications		Control rod travel rev/min	mm	Setting point		Test specifications	
		Control rod travel rev/min	mm	Control rod travel mm	rev/min			Control rod travel mm	rev/min	Control rod travel mm	rev/min
550	15,7-16,3	550	16,0	1400	14,5-14,8	510	0	100	6,2-8,2	900	15,8-16,0
				1430	10,0-14,4			200	4,7-6,8		
				1460	6,0-12,0			250	3,6-5,8	1050	15,3-15,6
				1500	0 - 8			300	2,0-4,4	1200	14,8-15,0
				1580	0			410	0		

Torque-control travel
on flyweight assembly dimension a = 0,4 mm + 0,05 Speed regulation At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min	cm³/-1000 strokes	rev/min		rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm
without	- 0,6 bar						
1400	73,5 - 75,5	900	- 0,35 bar	900	77,5 - 80,5		0,35 bar
with	- 0,6 bar						0,1 bar
1400	70,0 - 74,0			500	55,0 - 58,0		

En Checking values in brackets

Setting of manifold-pressure compensator - governor ..AB 605 DL

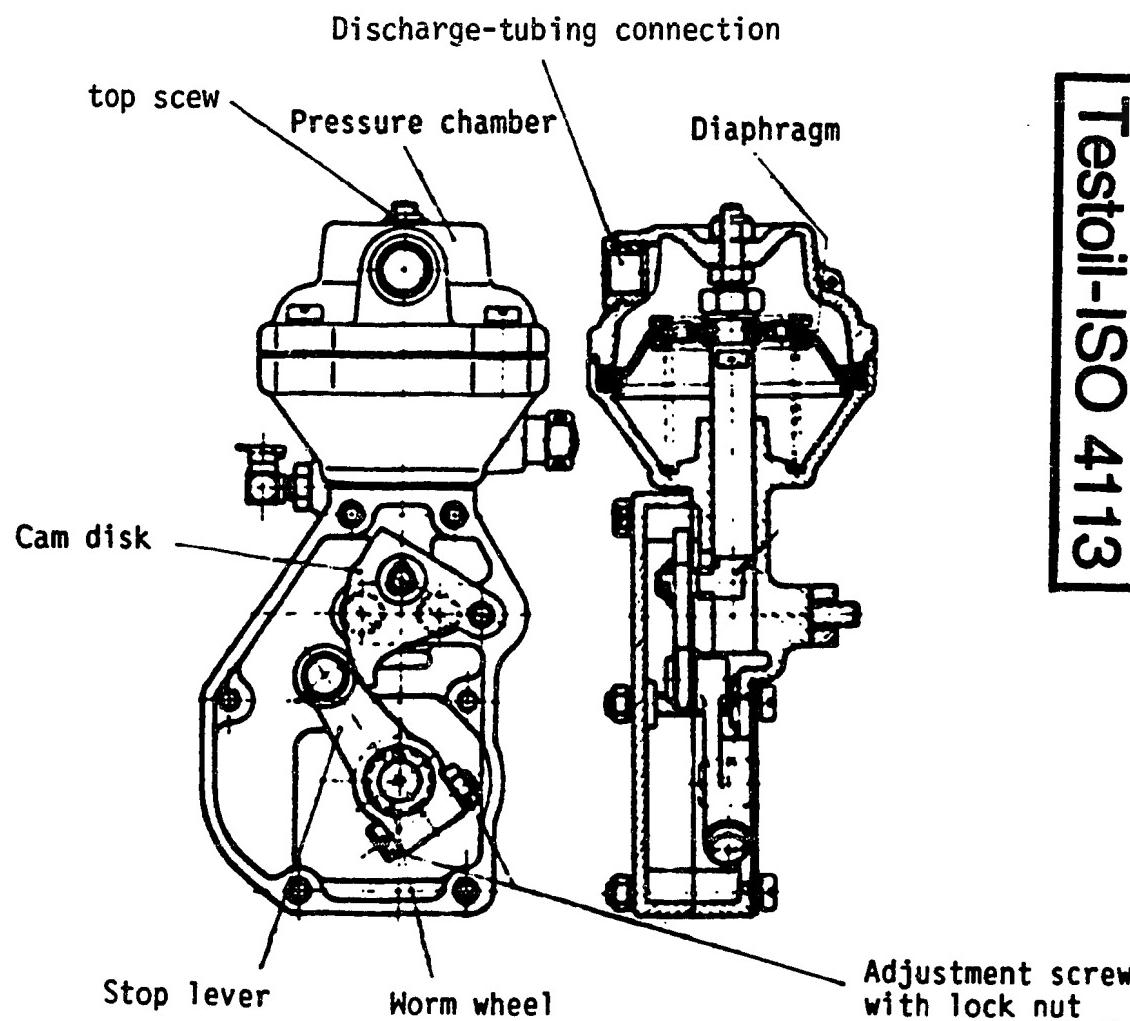
1. Connect up compressed air at discharge-tubing connection of diaphragm.

The charge-air pressure/gauge pressure can be set with compressed air, commercially available reducing valve and pressure gauge 0 - 3 atg.

2. Set full-load delivery at stop lever by turning adjustment screw (worm and worm wheel - roller makes contact with cam disk). Always tighten lock nut after performing adjustment!
3. Set full-load stop screw such that it makes slight contact - there must be no change in control-rod travel!
4. Test fuel-delivery characteristics - by changing charge-air pressure.

Whenever charge-air pressure is changed, move control lever back and re-position it.

5. Check: at $n = 900 \text{ min}^{-1}$, there must be no change in control-rod travel between 0.35 atg and 0.6 atg!
6. Set control-rod stop at $n = 900 \text{ min}^{-1}$ and 0.35 atg.



① **Test Specifications
Fuel Injection Pumps ①
and Governors**

40

DAI 8,3 u

3.66

PES 6 AM 90 B 410 R 3; R 5; R 9 RQV 250-1075 A 278 D
RS 2001

supersedes
company:
engine:

3.64
Daimler-Benz
OM 315

En

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,15 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,9 - 6,4	0,4			
	6	2,3 - 3,1				
	15	14,2 - 15,5				
200	9	3,8 - 4,6				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed Degree of deflection of control lever 1	Control rod travel mm 2	Intermediate rated speed Degree of deflection of control lever 4	Control rod travel mm 5	Lower rated speed Degree of deflection of control lever 7	Control rod travel mm 8	Sliding sleeve travel rev/min 10	mm 11
65±1,5	1075 1120 1160 1200 1280	14 - 17,5 9,6- 13,8 6,0- 10,4 2,0- 7,0 0			200 300 400 600 720	5,7-7,8 3,9-5,4 2,8-4,7 0 - 2,0 0	800 700 600 500 0
				10±1,5			
				3a			

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2	Rotational-speed limitation intermediate speed 3	Fuel delivery characteristics high idle speed 5a 4	Starting fuel delivery idle switching point 6	Torque-control travel Control rod travel mm 5
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 6	rev/min 8
			cm³/1000 strokes 5	cm³/1000 strokes 7
700	91,0 - 93,0	1080-1100	500 1000 1075	92,0-96,0 94,0-97,0 94,0-97,0

Checking values in brackets

* 1 mm less control rod travel than col. 2

① Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4
Edition 3.69

En

PE 12 P 120/920 LS 6 EP/RSUV 250-900 P10/303 DR
(V 8225 D)supersedes
company:
engine:Henschel
12 V 1516

1 - 6 - 7 - 10 - 3 - 2 - 11 - 8 - 5 - 4 - 9 - 12 je 30°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke		2,0 ^{+ 0,1} _{- 0,05}		mm (from BDC)						Spring pre-tensioning (torque-control valve)	
Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	4	Difference cm ³ / 100 strokes	2	Fuel delivery cm ³ /100 strokes	3				
600	9	16,4 - 17,0									
	6	9,4 - 10,6									
	12	21,8 - 24,3									

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Intermediate rated speed			4	Lower rated speed			Sliding sleeve travel ①	
				Degree of deflection of control lever	rev/min	Control rod travel mm		rev/min	mm	Control rod travel		
ca. 61	900	16,0						ca. 22°	250	7	300	0
	920	10,6	without		auxiliary				100	19 - 21	600	0,9-1,1
	940	5,0	spring						250	6,7-7,3	450	1,9-2,1
	920	8,8-11,9							350	5,5-6,1		
	950	3,8- 4,8	with auxiliary						580	0 - 1		
	1000	1,0- 2,6										
	1050	0,3- 1,0	spring									

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	2	4a	rev/min	cm ³ /1000 strokes	6	7	rev/min	control rod travel mm	5
880	ca. 10 mm RW			910 - 920						
Carry out adjustment on engine										

Checking values in brackets

* 1 mm less control rod travel than col. 2

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② Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4

Edition 12.6.68

En

PE 6 P 100/720 RS 15 RQ 250/1200 PA 22 D

supersedes
company: Daimler-Benz
engine: OM 346

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
	12	9,3 - 10,3				
1000	6	2,6 - 3,4				
	9	5,9 - 6,7				
200	9	2,5 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check Control rod travel rev/min 1	Control rod travel mm 2	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications Control rod travel mm 9	rev/min 10	rev/min 11	Control rod travel mm 12
600	15,7-16,3	600	16,0	1200 1250 1300 1360	15,6-16,0 8,0-13,0 0 - 7,8 0	580	0	200 300 400 480	6,5-8,1 4,4-6,6 0,8-3,6 0		

Torque-control travel
on flyweight assembly dimension a = 0 mm 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min 3	Fuel delivery characteristics		Starting fuel delivery idle speed	Control rod travel mm 6
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes/mm 7
1190	112,0 - 113,5	500	700 450	110,0-112,5 99,5-102,5	100	15 - 17

Checking values in brackets

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② Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4

Edition 1.2.71

En

PE 6 P 100/421 RS 185	RQ 300/1100 PA143DR (1) RQV250-1100 PA139DR (2)	supersedes - company: Saurer
PE 6 P 120/421 RS 187	RQ 300/1000 PA145DR (3) RQV250-1000 PA144DR (4)	engine: D 1 K (1,2) D 1 KL(3,4)

Cam sequence and angular spacing:
1 - 4 - 2 - 6 - 3 - 5 je 60° and WPP 110/2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 10 Ø cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery 12 Ø cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4-13,2	0,5	12	18,2-19,0	0,8
600	9	5,3- 6,5		6	4,0- 5,0	
600	12	11,3-12,8		12	15,8-17,5	
600	15	17,2-19,0		15	24,5-26,8	
200	9	3,6- 4,6		6	1,7- 2,7	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ ... PA 143 DR (1)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point	Test specifications	Setting point	Test specifications	Setting point	Test specifications	Control rod travel	Control rod travel	Control rod travel	Control rod travel	Control rod travel	Control rod travel
Control rod travel rev/min 1	Control rod travel rev/min 2	Control rod travel rev/min 3	Control rod travel rev/min 4	Control rod travel rev/min 7	Control rod travel rev/min 8	rev/min 9	rev/min 10	rev/min 11	rev/min 12	Control rod travel rev/min 11	Control rod travel rev/min 12
620	15,7-16,3	620	16,0	1100	14,7-15,0	600	0	100	6,6-8,1	800	15,8-16,0
				1150	8,0-13,0			200	5,7-7,7		
				1200	0 - 7,0			300	4,0-6,1	1050	15,0-15,3
				1250	0			400	1,3-3,8		
								500	0		

Torque-control travel on flyweight assembly dimension a = 0,3 mm 1 mm less control rod travel

630	15,7-16,3	630	16,0	1010	13,8-14,0	600	0	100	6,7-8,1	700	15,7-16,0
				1050	6,6-11,8			200	5,6-7,8		
				1080	0 - 8,0			300	3,9-6,2	900	14,0-14,4
				1140	0			400	1,3-3,7		
								500	0		

Torque-control travel on flyweight assembly dimension a = 0,6 mm ./.

Testoil-ISO 4113

The numbers denote the sequence of the tests

B. Governor Settings

RQV ...

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	10	
ca. .68	1100	15,0-18,0	-	-	-	ca. 12	180	6,4-8,0	1100	0
	1150	11,0-15,0					250	3,7-6,1		
	1200	6,6-11,8					350	1,9-3,3	800	0,3-0,5
	1280	0 - 6,2					490	0	500	0,5-0,7
	1360	0								
	RQV...PA139DR (2)						Torque-control travel on flyweight assembly dimension a = 0,6 mm			

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop			6 Rotational-speed limitat.		3a Fuel delivery characteristics			Starting fuel delivery		5	4a Idle stop
Test oil temp. 40°C (104°F)		Note: changed to ...	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	Idle	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	Idle	6	7	8	9
1100	120 - 122	1130(RQV) 600(RQ)	600	122 - 126	100	18 - 20					
1000	203 - 205	1030(RQV) 600(RQ)	600	210 - 214	100	25 - 27					
When checking extend by ± 1 cm ³ (col 2 and 5)!											

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	10	
ca. .68	1000	14,8-17,6	-	-	-	ca. 12	180	6,4-8,0	1000	0
	1050	10,3-14,3					250	3,6-6,0		
	1100	5,2-10,7					350	1,8-3,4	800	0,3-0,5
	1150	0 - 6,6					500	0	500	0,6-0,8
	1230	0								
	RQV...PA144DR (4)						Torque-control travel on flyweight assembly dimension a = 0,7 mm			

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop			6 Rotational-speed limitat.		3a Fuel delivery characteristics			Starting fuel delivery		5	4a Idle stop
Test oil temp. 40°C (104°F)		Note: changed to ...	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	Idle	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	Idle	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4
Edition 28.9.67

En

PE 6 P 100/720 RS 87 RQ 250/1025 PA 54 DR
(V8449) (V8886D)

supersedes
company: FBW
engine: EDU-A N

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	12,4 - 13,2	0,5			
600	9	5,4 - 6,4				
600	12	11,4 - 12,7				
600	15	17,3 - 18,8				
200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check Control rod travel rev/min		Full-load speed regulation Setting point Control rod travel rev/min				Idle speed regulation Setting point Control rod travel rev/min				Torque control Control rod travel rev/min	
1	2	3	4	5	6	7	8	9	10	11	12
980	13,1-13,7	980	13,4	1025	13,1-13,4	550	0	150	6,7-8,1	450	15,8-16,6
				1050	8,0-12,2			250	4,9-7,1	700	14,6-14,9
				1080	0 - 8,5			350	1,9-4,4		
				1140	0			450	0	900	13,4-13,8

Torque-control travel
on flyweight assembly dimension a =

0,8

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min		Fuel delivery characteristics rev/min			Starting fuel delivery Idle speed Control rod travel rev/min	
2	3	3a	4	5	6	7		
ca. 10 mm RW								

Checking values in brackets

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① Test Specifications Fuel Injection Pumps ① and Governors

40

SCA 14,0 b

1. Edition

En

PE 8 P 110/920/4	LS 172	EP/RSV 350-1100 P1/310 R (1)
PE 8 P 110A920/4	LS 209	
PE 8 P 110A920/4	LS 209	EP/RSV 350-1150 P1/371 R (2)
PE 8 P 110A920/4	LS 251	EP/RSV 350-1150 P1/371 R (3)

supersedes
company: Scania
engine: DS 14 (1-2)
D 14 (3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,8-13,6	0,5	12	13,4-14,2	2,5±0,1*
600	6	0,8- 1,8		6	1,3- 2,3	(max.2,2-2,9)
600	12	12,2-13,7		12	12,7-14,0	
600	15	17,3-18,8		15	18,2-19,8	
200	6	0,6- 1,6		6	0,6- 1,6	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

EP/RSV 350-1100 P 1 /310 R (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel		
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	1
1	2	3	2a	4	5	6	4	7	8	9	10
ca.67	1100	16,0		without		auxiliary		ca.31	350	6,0	
	1150	11,7							100	19 - 21	1080
	1200	6,0		spring					350	5,7-6,3	0
	1150	10,4-12,5							400	3,2-4,7	
	1200	4,4- 7,8		with auxiliary					550	0 - 1	
	1350	0,3- 1,0		spring							

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	Control rod travel rev/min
1	2	3	4	5	6	8
(1) 1100	162,0-164,0 (161,0-165,0) ** max. 6 (14 ± 0,5 mm RW) ** dispersion	1115-1125	600	158,0-161,0 ** max. 6	100 190 - 240 225 9 - 13)* ** max. 2) 1200 46 - 56) ** max. 4)	(ca. RW 6) (ca. RW 6)

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.74

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The numbers denote the sequence of the tests

B. Governor Settings

350-1150 P1/371R (2-3)

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	Control-lever deflection in degrees	rev/min	Lower rated speed	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11
ca.69	1150 1200 1240	16,0 11,6 7,1	without auxiliary spring with auxiliary spring	ca.31	350	6,0	100 350 420 500	19 - 21 5,7-6,3 1,9-3,7 0 - 1	screw in completely	
(2a)	1220 1260 1350	8,0-10,5 3,2- 6,5 0 - 1								

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp. 40°C (104°F)	rev/min	cm³/1000 strokes	rev/min	Note: changed to ...)	rev/min	cm³/1000 strokes	Idle	rev/min	Control rod travel mm
	1	2	3		4	5	6	7	8
(2) 1100 ** (14±0,5 mm RW)	162,0-164,0 max. 6)	1165-1175	600 **	158,0-161,0 max. 6)	100	190 - 240			
					225 **	9 - 13) max. 2)	*		
					1230 **	46-56) max. 4)	(ca.RW 6)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

** dispersion

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	Control-lever deflection in degrees	rev/min	Lower rated speed	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11
(2a)										

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp. 40°C (104°F)	rev/min	cm³/1000 strokes	rev/min	Note: changed to ...)	rev/min	cm³/1000 strokes	Idle	rev/min	Control rod travel mm
	1	2	3		4	5	6	7	8
(3) 1100	117,0-119,0	1180-1190: 1 mm RW less than column 2	350 **	9 - 13) max. 2)	100	mind. 20	350	6,0	
			1200 **	45 - 49) max. 4)					

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

H4

En

① Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4
Edition 15.5.72

En

PES 6 P 120/1320 RS 162 RQV 300-900 PA 117 R
300-800

Note sleeve position - see WPP 001/4, suppl. 6

supersedes
company: Baudoïn
engine: DPSR

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	12	21,8-22,7	0,8			
	6	5,7- 6,9				
	15	30,3-32,7				
200	6	2,6- 3,6				

Adjust the fuel delivery from each outlet according to the values in [] .

B. Governor Settings

RQV ... PA 117

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min	Control rod travel	①a	Degree of deflection of control lever	rev/min	Control rod travel	④	Degree of deflection of control lever	rev/min	Control rod travel	③	rev/min	mm	①
1	2	mm 3	②a	4	5	mm 6	④	7	8	mm 9	③	10	mm 11	MW
ca. 68	900 950 1000 1070	15,0-17,8 7,6-12,8 0 - 7,5 0	-	-	-	-	③a	ca. 12	200 350 500 630	7,2-8,2 3,8-6,1 1,5-3,0 0	200- 350- 500- 630-	Start 290 400 700 1020-1080	1,6-2,4 4,6-5,0 end 11	

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed ②b limitation intermediate speed	④a	Fuel delivery characteristics ⑤a high idle speed ⑤b	⑥	Starting fuel delivery Idle switching point	⑥	Torque-control ⑤ travel
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel
1	2	3	4	5	6	7	8	mm 9
ca. 10	mm RW - Carry out adjustment on engine	300-900 = 910						
		300-800 = 810						
		(VH ca. 63)						

Checking values in brackets

* 1 mm less control rod travel than col. 2

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①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4
Edition 15.12.70

En

PE 6 P 120/420 LS 152	RQV 300-1050 PA 112 KR	supersedes
sldg.-sleeve pos'n	U/min	company:
	180-260	mmRW
	Start	
	400	1,8-2,7
	550	3,8-4,2
	1000	7,5-7,9
	1200-1290	end (11)

supersedes
company:
engine:Allis Chalmers
Mark II

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	24,1 - 24,8	1,0			
600	6	6,7 - 7,9				
600	12	23,5 - 25,2				
600	15	30,6 - 32,6				
200	6	2,5 - 3,5				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1050	15,0-18,0	-	-	-	ca.10	250	6,4-8,0	See sect. C!	
	1100	10,7-15,0					350	3,0-5,2		
	1150	6,0-11,6					450	1,3-2,8		
	1210	0 - 7					550	0		
	1300	0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm
1	2	3	4	5	6	7	8	9	9
1050	290 - 292	1070	900 700	298 - 302 294 - 300					

Checking values in brackets

* 1 mm less control rod travel than col. 2

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H6

H6

①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4

Edition 13.3.72

En

PE 6 P 110 A 320 RS 100

RQV 200-1100 PA 181/2 R

Port-closing test with/without ROBO diaphragm

supersedes

Volvo

company:

THD 100

engine:

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,6 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	17,4 - 18,2	0,7			2,5 ± 0,1* (max. 2,2-2,9)
600	9	10,1 - 11,4				
600	12	16,7 - 18,2				
600	15	22,7 - 24,2				
200	9	7,6 - 8,6				

Adjust the fuel delivery from each outlet according to the values in

* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

B. Governor Settings

Upper rated speed Degree of deflection of control lever rev/min	Control rod travel mm	Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
		1a	2a	4	5	6	4	7	8	9	3	10
ca. 68	1150	15,5-18,3		-	-	-	ca. 23	100	7,0-10,0		-	-
	1410	0						200	5,0- 8,4			
ca. 66	1100	15,0-18,0						300	2,4- 5,2			
	1200	7,2-12,6						400	0 - 2,2			
	1260	2,0- 9,0						460	0			
	1400	0										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	4a	rev/min	5a	rev/min	cm³/1000 strokes	rev/min	control rod travel mm
1	2	3		4	5	6	7	8	9
0 kp/cm²				1,9-2,0 kp/cm²		100			
700	110,5-116,5			700	175,5-181,5				
				1,0 kp/cm²		225	15 - 19		
				700	162,5-166,5		dispersion max. 2,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

H7

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1. Basic adjustment (Sections A - B) without smoke limiter.

Set sliding-sleeve position 36.0 mm (refer also to WJP 211/31)

2. Stop adjustment (Attach smoke limiter and test at n = 800):

1st stage (outer spring - alter by way of shims beneath outer spring)

Start 0.19-0.27 kp/cm² (140-20, mmHg)

Difference 2.4 mm
control-rod travel

End 0.77-0.86 kp/cm² (570-630 mmHg)

2nd stage (outer and inner spring - alter by way of shims beneath inner spring)

Start 1.12-1.27 kp/cm² (830-940 mmHg)

End 1.43-1.63 kp/cm² (1070-1200 mmHg)

3. Setting full-load deliveries:

Set quantities injected at stop screw of bell crank at charge-air pressure 0 kp/cm².

By pressing on diaphragm - connect up compressed air - move stop such that more control-rod travel is attained than that required for full-load delivery at maximum charge-air pressure.

Set injected quantity at stop screw in housing at charge-air pressure 2.0 kp/cm².

Measure injected quantity at charge-air pressure 1.0; correct - if necessary - by adjusting retainer (guide bushing of springs).

Testoil-ISO 4113

② Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4
Edition 25.10.67

En

PE 6 P 100/821 LS 84
LS 93

RQ 175/1000 PA 51 DR

supersedes
company:
engine:Enassa
9109
(240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	12,4 - 13,2	0,5			
600	9	5,4 - 6,4				
600	12	11,4 - 12,7				
600	15	17,5 - 18,8				
200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check Control rod travel rev/min	1	Full-load speed regulation						Idle speed regulation						Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	11	Control rod travel mm	12	3	3	
1	2	3	4	5	6	7	8	9	10	11	12				
450	15,7-16,3	450	16,0	1000 1020 1050 1100	13,8-14,2 8,0-13,5 0 - 8,5 0	400	0	100 200 250 300	6,0-8,0 2,8-5,0 0 - 2,7 0	600	15,7-16,0				

Torque-control travel
on flyweight assembly dimension a =

0,7 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics			Starting fuel delivery Idle speed	
rev/min	cm³/-1000 strokes	rev/min	3	rev/min	cm³/-1000 strokes	6	rev/min	cm³/1000 strokes/mm
1	2	4	5	6	7	8	9	10
	ca. 10 mm RW							

Checking values in brackets

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① Test Specifications Fuel Injection Pumps ① and Governors

40

ALO 8,5 b
1. Edition

PE 6 P 110 A 320 RS 266 RQV..PA 173KR, 217KR, 294KR

supersedes
company: Allis Chalmers
engine:

see WPP 001/4, suppl. 3.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8+0,1 mm (from BDC)

(+0,15)
(-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,0-16,8	0,7			
600	9	8,4- 9,6				
	12	15,1-16,6				
	15	21,4-23,2				
200	9	6,7- 8,0				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

300-1025 PA173 KR

Upper rated speed Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel rev/min 3	Degree of deflection of control lever 1a	Intermediate rated speed			Control rod travel mm 6	Degree of deflection of control lever 7	Control rod travel mm 8	Sliding sleeve travel 1 rev/min 10	Sliding sleeve travel 1 mm 11
				Degree of deflection of control lever 4	Control rod travel rev/min 5	Control rod travel mm 4					
ca.66	1100	14,8-17,6	-	-	-	-	ca.10	250	6,2-8,0	350	1,8-3,0
	1150	10,6-14,7						300	4,2-6,5	600	3,9-4,4
	1200	6,0-11,4						400	0,2-5,6	1000	7,0-7,4
	1280	0 - 5,6						570	0		
	1360	0									

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 4a		Fuel delivery characteristics high idle speed 5b		Starting fuel delivery Idle switching point 6		Torque-control travel Control rod travel 5 mm 9	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	rev/min 5	cm³/1000 strokes 6	rev/min 7	cm³/1000 strokes 7	rev/min 8	rev/min 9
1015	89,0-91,0	1045-1055*	700	96,0-100,0	100	210			
					300	19 - 23			
						Charge-over point 150-250 U/min			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed				Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel 1	
1	2	3	2a	4	5	6	4	7	8	9	3	10 rev/min mm	11
ca.66	1100	14,8-17,6	-	-	-	-	ca.10	250	6,2-8,0	350	1,8-3,0		
	1150	10,6-14,7						300	4,2-6,5	600	3,9-4,4		
	1200	6,0-11,4						400	0,2-5,6	1000	7,0-7,4		
	1280	0 - 5,6						570	0			-	-
	1360	0					(3a)						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤			
rev/min	cm³/1000 strokes	1	rev/min	3	4a	rev/min	cm³/1000 strokes	6	rev/min	Control rod travel mm	8	9
990	120,0-122,0	1020-1030*	700	124,0-126,0		100	210		300	19 - 23		

Change-over point
150-250 U/min

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

300-1000 PA 294KR

B. Governor Settings

Upper rated speed			Intermediate rated speed				Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel 1	
1	2	3	2a	4	5	6	4	7	8	9	3	10 rev/min mm	11
ca.66	1100	14,8-17,6	-	-	-	-	ca.10	250	6,2-8,0	350	1,8-3,0		
	1150	10,6-14,7						300	4,2-6,5	600	3,9-4,4		
	1200	6,0-11,4						400	0,2-5,6	1000	7,0-7,4		
	1280	0 - 5,6						570	0			-	-
	1360	0					(3a)						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤		
rev/min	cm³/1000 strokes	1	rev/min	3	4a	rev/min	cm³/1000 strokes	6	rev/min	Control rod travel mm	8
LDA 1000	1,1 bar 135,0-137,0	1045-1055*	LDA 500	1,1 bar 131,5-135,5	100	210					
			LDA 500	0 bar 75,5-83,5	300	19 - 23					

Change-over point
150-250 U/min

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

D. Adjustment Test for Manifold Pressure Compensator

ALO 8,5 b

-3-

Test at $n =$ 500 rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting Gauge pressure =	bar	Measurement Gauge pressure =	bar	Control rod travel- mm	diminution (1) difference
	0,75-0,80 = 0,2 mm RW less than full load		0,19-0,26 = 2,3 mm RW less than full load			

Notes:

(1) when $n =$

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

H12

H12 En

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4

Edition 1.4.64

En

PE 6 P 120/300 S 12

PE 6 P 120/320 S 13

EP/RSUV 250-900 P 5/305

supersedes

company

engine

Marini
CB 12 TC

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,0 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	27,7-28,7	1,0			
600	6	6,8- 7,8				
600	12	24,8-26,8				
600	18	43,8-46,3				
200	6	4,2- 5,2				

Adjust the fuel delivery from each outlet according to the values in □

B. Governor Settings

1	Upper rated speed rev/min		Intermediate rated speed			4	Lower rated speed		3	Torque control	
Degree of deflection of control lever	Control rod travel mm		Control rod travel mm rev/min			Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
ca. 68	800	16				ca. 27	250	8			
	820	11,7	without auxiliary spring				50	23 - 25	780	0	
	840	6,7					250	7,7-8,3	400	0	
2a	850	4 - 6	with auxiliary spring				300	3,3-5,4	290	1,2-1,8	
	880	0 - 3,2					350	0 - 2,2			
	930	0 - 1					400	0 - 1			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp. 40°C (104°F)	6	Rotational-speed limitat. Note: changed to 1 rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop
rev/min	cm³/1000 strokes	3	rev/min	4	cm³/1000 strokes	6	7	8	Control rod travel mm
1	2								9
ca. 10,5 mm RW		910-920						250	8

Checking values in brackets

* 1 mm less control rod travel than col. 2

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② Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4

Edition 9.66

En

PE 4 P 120/720 LS 70 RQ 325/775 PA 41 R

PE 4 P 120/300 LS 71

1 - 2 - 4 - 3) S 70 1 - 3 - 4 - 2) S 71
0 - 90 - 135-225 0 - 45 - 135-270

supersedes

company:

engine:

Simmering-Oras-
Pauker
S 108 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	12	19,3 - 19,8	0,8			
600	9	12,0 - 13,3				
	15	23,8 - 25,5				
200	9	9,6 - 10,8				

Adjust the fuel delivery from each outlet according to the values in [] .

B. Governor Settings

Checking of slider PFG check	Control rod travel rev/min	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
550	15,7-16,3	550	16,0	775	15,6-16,0	535	0	200	7,2-8,1	-	-
				800	9,6-14,1			250	6,0-8,1		
				830	0 - 8,8			300	4,2-6,6		
				880	0			390	0 - 2,6		
								435	0		

Torque-control travel
on flyweight assembly dimension a = mm 1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min	cm³/-1000 strokes	rev/min	Control rod travel mm	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm
1	2	3	4	5	6	7	8
ca.	10,5 mm RW						

Checking values in brackets

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① Test Specifications Fuel Injection Pumps ① and Governors

40

SAU 11,5

Edition 13.5.69

En

PE 6 P 100/420 RS 104
(V 8638)
RS 104 ZRQV 250-1100 PA 63 DR
(V9124)supersedes 6.10.67
company: Saurer
engine: D K

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4-13,2	0,5			
600	9	5,4- 6,4				
600	12	11,4-12,8				
600	15	17,3-19,0				
200	9	3,6- 4,6				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm 1	Control rod travel mm 2	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca.66	1100 1160 1240 1310	15,0-18,2 8,6-13,8 0 - 6,8 0	- - -	- - -	- - -	ca.10	200 300 400 600 740	6,1-8,0 3,5-4,9 2,8-3,8 0,8-2,1 0	1100 900 700 500	0 0,1-0,3 0,4-0,6 0,5-0,7
						38				

Torque control travel a = 0,6 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	rev/min 8	Control rod travel mm 9
1100	104,5-107,5	1120	700	107,0-111,0			
1100	106,5-109,5	1120	700	109,0-113,0			
"Z"							

Checking values in brackets

* 1 mm less control rod travel than col. 2

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H19

H19

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4

Edition 7.71

En

PE 6 P 120/320 RS 57

EP/RSUV 250-900 P 10/316 R

supersedes
company
engine

Breda
D 30 S 6

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery		Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
		2	3				
1000	12	18,2-19,0					
600	9	8,1- 9,3					
600	12	17,0-18,4					
600	15	26,3-27,9					
200	9	6,1- 7,3					

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca.67	900	16,0	without auxiliary spring			ca.25	250	8,0	880	0
	920	12,0					100	19 - 21	375	0
	940	8,0					250	7,7-8,3	290	1,2-1,8
2a	940	6,0-9,4	with auxiliary spring				275	6,0-7,0		
	950	4,7-7,4					320	1,4-4,5		
	975	1,3-4,2					390	0 -1,0		
	1020	0 -1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)	rev/min	cm³/1000 strokes	6 Rotational-speed limitat Note changed to rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle	5 rev/min	cm³/1000 strokes	4a Idle stop Control rod travel mm
				4	5				
880	ca.10,5 mmRW								

Checking values in brackets

* 1 mm less control rod travel than col 2

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H20

H20

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4

Edition 23.2.66

En

PE 8 P 120/520/5 RS 42

EP/RSUV 250-100Q P0/4 R

supersedes
company
engine

Kaelble
M 140

1 - 5 - 6 - 8 - 4 - 2 - 7 - 3
0 -45 -90 -135-180-225-270-315°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	27,7-28,7				
	6	6,6- 7,8				
	12	24,8-26,8				
	15	36,3-38,8				
	6	4,2- 5,2				
200						

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1	Upper rated speed rev/min	Intermediate rated speed	4	Lower rated speed	3	Torque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Control-lever deflection in degrees	Control rod travel mm	Control rod travel rev/min	Control rod travel mm
1	2	3	7	8	9	10
ca.62	1000	16,0	ca.21	250	8	
	1040	10,2		100	19 - 21	980
	1060	6,4		250	7,7-8,3	500
				350	1,5-4,5	0
	1040	8,0-12,0		550	0 - 1	300
	1100	1,5- 4,5				1,2-1,8
2a	1200	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b	Full-load stop Test oil temp 40°C (104°F)	6	Rotational-speed limitat Note changed to) rev/min	3a	Fuel delivery characteristics	Starting fuel delivery Idle	5	4a	Idle stop Control rod travel mm
rev/min	cm³/1000 strokes	3	rev/min	4	cm³/1000 strokes	6	7	8	9
ca.10,5 mm RW		1010-1030							

Checking values in brackets

* 1 mm less control rod travel than col 2

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Test Specifications

Fuel Injection Pumps 1A

and Governors

40

VDT-WPP 001/4

23.6.69

En

PE 8 P 110/920 LS 34

EP/RSUV 250-750 P. 9/311 DR
250-900 P10/303 DR
(V 8225 D)

supersedes
company
engine

Henschel
8 V 1416 A

1 - 8 - 5 - 4 - 7 - 2 - 3 - 6 - 1

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

0 - 30 - 90 - 120 - 180 - 210 - 270 - 300 - 360°

Port closing at prestroke

mm (from BDC)

2,0 + 0,1

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	12	19,0-19,8	0,8			
600	6	6,7- 7,7				
	15	24,2-25,9				
200	6	4,7- 5,7				

Adjust the fuel delivery from each outlet according to the values in

Control lever = 35°

250 - 750 P 9/311 DR

B. Governor Settings

Degree of deflection of control lever 1	① Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca.54	750	16	without auxiliary spring	ca.20	250	7	730	0	600	0,7-0,9
	760	13			60	19 - 21		450		1,6-1,8
	770	9			250	6,7-7,3		250		2,1-2,3
	770	6,5-10,4			350	3,5-5,2				
2a	820	2,0- 3,3	with auxiliary spring		520	0 - 1				
	900	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp 40°C (104°F)		⑥ Rotational-speed limitat Note changed to) rev/min	③a Fuel delivery characteristics			Starting fuel delivery Idle	⑤	④a Idle stop Control rod travel mm	
rev/min	cm³/1000 strokes	3	4	5	rev/min	cm³/1000 strokes	6	7	8
ca. 10 mm RW - Carry out adjustment on engine	760 910								

Checking values in brackets

* 1 mm less control rod travel than col 2

BOSCH

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Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

250-900 P10/303 DR (V 8225 D)

Control lever - 35°

ca.61	900 920 940 930 960 1060	16 10,6 5,0 4,8-9,8 3,2-4,3 0 - 1	without auxiliary spring			ca.22	250 100 250 400 600	7 19 - 21 6,7-7,3 2,8-4,8 0 - 1	880	0 0,9-1,1 1,9-2,1
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Testoil-ISO 4113

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Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4

Edition 7.4.72

En

PE 8 P 120/501/5 LS 61 - - -
 PE 8 P 120/520/4 LS 62 EP/RSUV 250-1000 P0/1001 R
 Pumps run in tandem

supersedes
company
engine

Henschel
16 V 1516 A

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC) 2,0 + 0,1

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve)
1	2	3	4	2	3	6
1000	12	23,0-23,4	0,8	Cam sequence and angular spacing:		
600	6	6,5- 7,5		S 61: 1-6-3-7-2-5-4-8		
	12	20,3-21,8		0-75-90-135-210-225-300-315°		
	15	25,8-27,5		S 62: 1-8-3-6-2-7-4-5		
200	6	2,6- 3,6		0-75-90-165-210-225-300-315°		

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Control lever - 35°

① Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees	Lower rated speed		③ Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca. 70	1000	18	without auxiliary spring	ca. 16	250	Control lever deflection in degrees	8	980	Torque control	0
	1015	14,4			100		15 ... 21	300		0
	1030	7,4			250		7,7...8,3	150		1,7...2,3
②a	1030	5,4...11,8	with auxiliary spring	300	300		4,3...6			
	1040	0,4... 8,2			375		1,6...4,7			
	1080	0 ... 1			410		0 ... 1			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limitat Note: changed to ..) rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle	⑤ Idle stop	④a Control rod travel mm
rev/min	cm³/1000 strokes	3	4	5	6	7	8
Carry out adjustment	on engine						
980	ca. 237	1030					

Checking values in brackets

* 1 mm less control rod travel than col. 2

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H24

H 24

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4
Edition 9.69

En

PE 6 P 120/420 RS 119 RQ 250/1100 PA 73 DR

Cam sequence 1 - 4 - 2 - 6 - 3 - 5
Angular cam spacing 60°

supersedes

company:

engine:

Saurer
DKT

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	25,2-26,0				
600	6	4,4- 6,0				
600	12	19,3-21,1				
600	15	28,7-30,7				
200	9	3,0- 4,4				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check	Control rod travel mm	Full-load speed regulation						Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12	11	12
		550	15,6-16,4	550	16,0	1100	14,9-15,3	530	0	100	6,9-8,1	550	16,0
						1120	10,6-15,2			200	5,3-7,6	700	15,9-16,0
						1150	3,0-11,0			300	2,7-5,1	900	15,5-15,8
						1200	0 - 3,5			400	0 - 1,1		
						1230	0			430	0	1100	14,9-15,3

Torque-control travel
on flyweight assembly dimension a = 0,25 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics			Starting fuel delivery Idle speed		Control rod travel	
rev/min	cm³/-1000 strokes	rev/min	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm	rev/min	cm³/1000 strokes/mm	rev/min
1	2	3	4	5		6	7			
	ca. 10,5 mmRW									

Checking values in brackets

②

Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4

Edition 24.11.71

En

PE 6 P 100/720 RS 117
110/721RQ250/1075 PA 71 DR
RQV250-1075PAV9485 D
RQV250-500/1075 PA171
RQV250-1075 PA 119Dsupersedes 20.6.68
company: F B W
engine: E 3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8+0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	12,5-13,1	0,4	12	14,8-15,4	
600	9	5,3- 6,5		9	7,3- 8,5	
600	12	11,3-12,8		12	14,1-15,7	
600	15	17,3-18,9		15	20,7-22,7	
200	9	3,6- 4,6		9	5,5- 6,5	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ...PA 71 DR

Checking of slider PRG check	Control rod travel rev/min	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Control rod travel rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1000	13-13,8	1000	15,4	1075 1100 1130 1180	13,1-13,4 7,0-12,0 0 - 8,3 0	550	0	100 250 350 450	7,0-8,1 4,8-6,9 1,9-4,2 0	450 600 600 900	15,8-16,7 15,1-15,4 13,4-13,7

Torque-control travel
on flyweight assembly dimension a = 0,8 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed		6 Control rod travel mm
rev/min	cm ³ /1000 strokes	rev/min	3	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes/mm	
1	2	4	5	6	7			
ca. 10 mm RW								

Checking values in brackets

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

250-1075 PAV 9485D

* a = 0,5 mm

ca.66	1075	16,0-18,0	-	-	-	ca.10	200	6,5-8,0	1075	0
	1150	7,0-12,0					300	3,3-4,4	800	0,4-0,6
	1200	2,0- 8,0					450	2,0-3,4		
	1280	0					680	0	600	0,4-0,6

250-500/1075 PA 171

ca.66	1100	11,4-14,6	ca.54	550	7,3-14,5	ca.10	100	6,4-8,0	-	-
	1150	5,7-10,8		650	2,5- 3,5		200	5,1-7,3		
	1200	0 - 6,7		1050	2,5- 3,5		300	3,1-5,4		
	1280	0		1160	0		470	0		

250-1075 PA 119D

* a = 1,5 mm

ca.66	1075	15,0-17,6	-	-	-	ca.10	100	7 - 8	1075	0
	1120	9,8-14,4					250	3,6-5,9		
							400	2,4-3,8		
							550	0,9-2,3		
							690	0		

* Torque-control travel

Testoil-ISO 4113

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

En

40

VDT-WPP 001/4
BÜS 12,3 a
Edition 6.68

PE 6 A 100 C 310 LS 3002 RQ 250/1100 AB 659 DL
(V 9180 D)
RQV250-1100 AB 664 DL

supersedes
company:
engine:

Büsing
U 12 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	9	7,5 - 8,3	0,4			
1000	6	3,2 - 4,2				
	12	12,4 - 13,4				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ ... AB 659 DL

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point	Test specifications	Setting point	Test specifications	Setting point	Test specifications	Control rod travel	Control rod travel	Control rod travel	Control rod travel	Control rod travel	Control rod travel
Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	Control rod travel rev/min	Control rod travel mm
1050	14,9-15,2	1050	15,2	1120	14,8-15,2	520	0	100	7,0-8,1	450	15,8-16,5
	Breakaway not before n = 1120			1150	10,0-14,0			200	5,8-7,9	600	15,5-15,8
				1200	0 - 8,5			300	3,1-5,4		
				1270	0			420	0	750	15,2-15,4

Torque-control travel
on flyweight assembly dimension a = 0,25 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	Control rod travel
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm
1100	126,5-129,5	500	800	124,0-128,0	100	ca. 18 mm RW
			600	119,5-123,5		./.

Checking values in brackets

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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1100	15,0-18,0	-	-	-	ca.10	200	6,4-8,0		
	1150	10,0-14,3					300	3,2-5,2	1100	0
	1200	4,0-10,0					500	2,1-3,8	800	0,2-0,4
	1310	0					600	0,6-1,8	600	0,3-0,5
							710	0		

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	4a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
1100	125,5-128,5	1120	500	4	119,0-123,0	100	18 - 19	To be specified by customer		
			700	5	126,5-130,5					

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure CompensatorTest at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm

En

Testoil-ISO 4113

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4
BOS 11,4 a
Edition 10.66

En

PE 6 A 100 C 312 LS 3002	RQ 250/1050 AB 582 DL	supersedes
LS 3002 Z		company:
LS 3002 Y		engine:
LS 3002	RQV 250-600/1050 AB 597DL	Büssing
	AB 611DL	U 11 D - 210 P
		"Z" - 185 P
		"Y" - 195 P

See BMP 111/35 - EP

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	7,5 - 8,3	0,4			
	6	3,2 - 4,2				
	12	12,4 - 13,4				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check	Control rod travel mm	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications	④	Setting point rev/min	Control rod travel mm	Test specifications	⑤	Control rod travel mm	③
rev/min	2	3	4	5	6	7	8	9	10	11	12
1000	14,6-15,4	1000	15,0	1070 1100 1140 1180	14,8-15,0 7,0-13,0 0 - 7 0	520	0	150 250 350 420	6,5-8,1 4,5-6,5 1,0-3,4 0	650 700	15,6-16,0 15,0-15,4

Torque-control travel
on flyweight assembly dimension a = 0,3 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics			Starting fuel delivery Idle speed	
rev/min	cm³/-1000 strokes	rev/min	3	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm	7
1	2	4	5	6	7	6	7	
1050	121,0 - 124,0		500	600 500	116,0- 120,0 112,0- 116,0	100	ca. 18mm RW	./.

Checking values in brackets

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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm	1
1	2	3	2a	4	5	6	7	8	9	10	11			
66±1,5	1050	15,0-18,0		54±1,5	580	14,7-15,3		10±1,5	150	6,2-8,0		600	0	
	1100	7,3-13,0			650	6,0-14,0			250	5,0-7,3				
	1150	0 - 7			750	2,5- 3,5			400	2,0-4,5		500	0,2-0,4	
	1210	0			1050	2,5- 3,5			550	0		350	0,3-0,5	
					1110	0								

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery Idle switching point	Torque-control travel			
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4a	5	6	7	8	9	10
1050	103,5-106,5		500	600	101,5-105,5				
				500	94,5- 98,5				
1050	114,0-117,0		500	600	106,5-110,5				
				500	101,5-105,5				
1050	118,5-121,5	1060-1080		600	110,0-114,0	100	ca.18mmRW		
				500	106,5-110,5				

* 1 mm less control rod travel than col. 2

Checking values in brackets

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm	1
1	2	3	2a	4	5	6	7	8	9	10	11			
								*						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery Idle switching point	Torque-control travel			
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4a	5	6	7	8	9	10

* 1 mm less control rod travel than col. 2

Checking values in brackets

En

② **Test Specifications**
Fuel Injection Pumps ②
and Governors

40

VDT-WPP/ 001/4 BOS 11,4 b

Edition 6.68

En

PE 6 A 100 C 410 RS 3004
 412

RQ 250/1050 AB 636 DL
 RQV250/600/1050AB670DL ./.

supersedes

company: Büssing
 engine: S 11 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	7,5 - 8,3	0,4			
	6	3,2 - 4,2				
	12	12,4 - 13,4				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

RQ .. AB 636 DL

B. Governor Settings

Checking of slider PRG check	Control rod travel rev/min	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications rev/min	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min
1	2	3	4	5	6	7	8	9	10	11	12
1000	14,9-15,5	1000	15,2	1070	14,8-15,2	520	0	100	7,1 - 8,1	400	15,8-16,5
Breakaway not before n = 1070				1100	7,0-13,2			200	5,6 - 7,7	500	15,4-15,7
				1130	0 - 9,0			300	2,9 - 5,2		15,2-15,3
				1180	0			420	0		

Torque-control travel on flyweight assembly dimension a = 0,25 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm
1	2	3	4	5	6	7
1050	124,5 - 127,5	500	700 500	122,5 - 126,5 118,5 - 122,5	100	ca. 18 mm RW . /.

Checking values in brackets

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B. Governor Settings

RQV .. AB 670 DL

1

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
66±1,5	1050	15,0-18,0	54±1,5	580	14,7-15,3	10±1,5	150	6,2-8,0	600	0
	1100	7,3-13,0		650	6,0-14,0		250	5,0-7,3		
	1150	0 - 7		750	2,5- 3,5		400	2,0-4,5	500	0,2-0,4
	1210	0		1050	2,5- 3,5	0	550	0	350	0,3-0,5

Torque control travel a 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed	Fuel delivery characteristic: high idle speed	Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4a	5a	6	8	9
1050	124,5-127,5	1070	700 500	121,0-125,0 119,0-123,0	100	18 - 18,5 mm RW	To be specified by customer

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel-diminution difference mm

En

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 MB 8,7 e

Edition 7.71

En

PES 6 A 100 C 320 RS 3010	RQV 300-1125 AB693 D	(1)	supersedes	6.69
	300-1275	(2)	company:	Daimler Benz
RS 3010	RQV ...ABV10577D,10823D	(1,2)	engine:	OM 360 H

PES 6 A 90 C 320 RS 2272 RQV 300-1125 AB693D (3)

Switch-over point is where the automatic control rod stop locks and unlocks.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5+0,1(3010) mm (from BDC) 3,0 + 0,1 (2272)

Rotational speed rev/min	Control rod travel mm	Fuel delivery 3010 cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery 2272 cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	5
1000	9	7,6 - 8,2	0,4	9	7,4 - 7,9	
	6	2,2 - 3,2		6	2,9 - 3,7	
	15	18,2 - 19,4		15	16,0 - 17,3	
200	9	5,0 - 6,0		6	1,5 - 2,5	

Adjust the fuel delivery from each outlet according to the values in □.

B. Governor Settings

300-1125 AB 693 D (1,3)

Upper rated speed Degree of deflection of control lever	Intermediate rated speed			Lower rated speed			Sliding sleeve travel			①		
	Control rod travel rev/min	Control rod travel mm	①	Control rod travel rev/min	Control rod travel mm	④	Control rod travel rev/min	Control rod travel mm	③	Control rod travel rev/min	Control rod travel mm	①
1	2	3	4	5	6	7	8	9	10	11		①
ca.66	1125	15 - 17,7	-	-	-	ca.10	100	7,5-8,0				
	1150	13,1-16,3					200	6,2-7,9				
	1200	9,0-13,5					300	5,0-6,8				
	1250	4,7-10,3					400	3,0-5,1				
	1300	0 - 7,1					600	0 - 1,1				
	1400	0					630	0				

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point	Torque-control travel			
rev/min	cm³/1000 strokes	②	③	④	⑤	⑥			
1	2			4	5	6	7	8	9
(S 3010 1) 1100	95,5 - 98,5	1150:0,5-1,0 mm RW less than column 2	500	93,0-96,0	100	14,7-15,3			
				Adjusting the minimum rated speed		Change-over point			
						250-200 U/min /	300	-	
						200-150 U/min /	250	-	

Checking values in brackets

* 1 mm less control rod travel than col. 2

J12

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J12

The numbers denote the sequence of the tests

250-1125 ABV 10577D MB 8,7 e

-2-

B. Governor Settings

RQV..

250-1275 ABV 10823D **

Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			Control-lever deflection in degrees 7	Lower rated speed		Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
(1) ca.66	1125	15 - 17,6	-	-	-	ca.10	100	5,6-7,6	-	-
	1150	13 - 16,5					200	4,6-6,6		
	1200	9,4- 13,8					300	2,9-4,9		
	1250	5,2- 10,8					400	1,8-3,1		
(2) 2a	1300	0,8- 7,6				ca.10	525	0-1,2		
	1420	0					580	0		
	1275	15,0-17,6					150	6,7-8,0		
	1350	9,8-14,1					250	5,7-7,4		

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery		5	4a Idle stop	Control rod travel mm 9
	rev/min 1	cm³/1000 strokes 2	Note: changed to ...) rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	
1250	96,0 - 99,0	1300:0,5-1,0 mm ***	500	max. 96,0	100	14,7-15,3			

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Torque-control travel a = 0

*** less than column 2

B. Governor Settings

Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			Control-lever deflection in degrees 7	Lower rated speed		Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
(2) ca.66	1400	6,0 -11,5					350	4,3-5,9		
	1480	0 - 7,0					500	1,0-3,5		
	1590	0					640	0		
	1275	15,0 -18,4				ca.10	100	6,5-8,0		
	1350	10,0 -14,7					250	4,7-6,8		
2a	1420	4,6 -10,7					350	2,7-4,8		
	1500	0 - 6					450	1,6-3,1		
	1600	0					600	0		

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery		5	4a Idle stop	Control rod travel mm 9
	rev/min 1	cm³/1000 strokes 2	Note: changed to ...) rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	
1100	92,5 - 94,5	1150:0,5-1,0 mmRW ***	500	93,0-96,0	100	14,7-15,3			

Checking values in brackets

* 1 mm less control rod travel than col. 2

②

Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4
Edition 2.2.73

En

PES 6 P 100 A 420 RS 262 RQ 300/1100 PA 219 DR
RQV250-1100 PA 139 DRsupersedes:
company: Saurer
engine: D 2 K
(240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	12,4 - 13,2	0,4			
600	9	5,2 - 6,6				
600	15	17,1 - 19,1				
200	9	3,5 - 4,7				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ 300/1100 PA 219 DR

Checking of slider PRG check	Full-load speed regulation				Idle speed regulation				Torque control		
	Setting point Control rod travel rev/min	Control rod travel mm	Test specifications Control rod travel rev/min	Setting point Control rod travel rev/min	Control rod travel mm	Test specifications Control rod travel rev/min	Control rod travel mm	Control rod travel mm	Control rod travel rev/min	Control rod travel mm	
1	3	4	5	6	7	8	9	10	11	12	
650	15,7-16,3	650	16	1120	15,1-15,4	600	0	180	6,3-8,1	770	15,8-16,0
Speed regulation less control-rod travel at 1150-1170 min/1	1±0,5 mm			1160	8,7-13,7			250	5,3-7,3		
				1200	0 - 9			350	3,1-5,3	950	15,4-15,6
				1270	0			500	0		

Torque-control travel
on flyweight assembly dimension a = 0,2 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed		6
rev/min	cm³/-1000 strokes	rev/min	3	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes/mm	Control rod travel mm
1	2	4	5	6	7	6	7	mm
1100	120,0-122,0		500	700	126,0-130,0			16 - 18
				500	114,5-119,5			

Checking values in brackets

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel
1	2	3	2a	4	5	6	7	8	9	10	11	1
ca.68	1100	15,0-18,0		-	-	-	ca.12	180	6,4-8,0	1100	0	
	1150	11,0-15,0						250	3,7-6,1			
	1200	6,6-11,8						350	1,9-3,3	800	0,3-0,5	
	1280	0 - 6,2						490	0			
	1360	0					(3a)			500	0,5-0,7	

Torque control travel a = 0,6mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery Idle switching point	Torque-control travel		
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel
1	2	3	2a	4	5	6	7	8	9	10	11	1

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)			Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery Idle switching point	Torque-control travel		
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

① Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4

Edition 11.72

En

PE 6 P 110 A 820 LS 255 RQV 225-1100 PA206 R (1)
 225-1250 (2)
 RQ 225/1250 PA207 R (3)

supersedes

company:

Fiat
8200.12,

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,3 - 17,1	0,5			
	9	8,9 - 10,3				
	12	15,1 - 16,8				
	15	21,5 - 23,5				
	9	7,2 - 8,4				

Adjust the fuel delivery from each outlet according to the values in _____.

B. Governor Settings

RQV 225-1100 PA206 (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm 3	①a	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	④	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	③	rev/min 10	mm 11
ca.66	1100	14,8-17,8	-	-	-	-	④	ca.10	150	6,6-8,0	1100	8,2	
	1150	9,8-14,2					④		250	5,0-6,8			
	1220	2,0- 8,6					④		350	2,9-4,1			
	1310	0					④		500	1,8-3,1			
							④		710	0			
							④						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b rev/min 3		Fuel delivery characteristics high idle speed ⑤b rev/min 4		Starting fuel delivery idle switching point ⑥ rev/min 6		Torque-control travel Control rod travel rev/min 8	
rev/min 1		rev/min 3		rev/min 4		rev/min 6		rev/min 8	
rev/min 1	cm³/1000 strokes 2	rev/min 3	cm³/1000 strokes 5	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	cm³/1000 strokes 9
1100	106 - 108	1120				100	21 - 23		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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B. Governor Settings RQV 225-1250 PA 206 (2)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1250	14,8-17,8	-	-	-	ca.10	120	6,5-8,0	1250	8,2
	1270	6,0-11,4					200	5,5-7,2		
	1340	0 - 6,2					320	2,8-4,4		
	1430	0					500	1,8-3,5		
							790	0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)			Rotational-speed limitation		Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
1250	112 - 114	1270				100	21 - 23			

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings RQ 225/1250 PA 207 (3)

Checking of slider		Full load speed regulation				Idle speed regulation				Torque control	
PRG check	Control rod travel	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm
rev/min	mm	1	2	3	4	7	8	9	10	11	12
550	15,7-16,3	550	16,0	1270	15,6-16,0	510	0	100	6,3-8,1	-	-
				1300	9,5- 15			200	4,7-6,8		
				1350	0 - 8,2			300	2,1-4,3		
				1400	0			410	0		

Torque-control travel
on flyweight assembly dimension a

mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)			Control rod stop		Fuel delivery characteristics			Starting fuel delivery Idle speed		(6)	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
1240	106 - 108	1250						100	21 - 23		
When checking extend by ± 1 cm³ (Sect. C, col. 4 and 5)!											

En Checking values in brackets

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4

1. Edition

ED

PE 6 P 110 A 321 RS323

EP/RSV 300-1200 P 2/408R

supersedes
company
engine

Berliet
MIS 620 x 30

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke

2.6 + 0.1

mm (from BDC) (+ 0,15)
- 0,05

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12					
200	9					

4. Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4		Lower rated speed		3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
ca.50	1150	16,0				ca.21	300	4,8	1200	0	
	1250	10,8	without auxiliary spring				150	19 - 21			
	1320	6,2					300	4,5-5,1			
2a	1200	12,2	with auxiliary spring				500	0,7-2,8			
	1300	6,8					650	0 - 1			
	1480	0,3-1,0									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limitat Note: changed to rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop Control rod travel mm	
rev/min	cm³/1000 strokes	3	rev/min	cm³/1000 strokes	6	cm³/1000 strokes	8	9
LDA 1200	0,6 bar 122,0-124,0	1260-1270*	LDA 350	0 bar 91,5-95,5	100	110-140		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure =	Measurement Gauge pressure =	Control rod travel- diminution mm (1)
323 with 408R	0,34-0,37	0,20-0,25	-0,2 -0,8

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications

Fuel Injection Pumps 1A

and Governors

40

DAI 20,1 f
Edition 10.69

En

PE 6 P 120/320 RS 28	EP/RSUV 250/800P 5/309 R	supersedes:	8.66
RS 36	225-800P 5/309 R, 310R	company	Daimler-Benz
	225-600P 3/309 R*	engine	MB 846 A
	225-500P 2/309 R**		MB 846 Ab ./. .

Governors: basic setting 35°
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery S 28 cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery S 36 cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	5
600	12	17,4 - 18,1	0,8 600	6	9,3-10,8	
	6	6,5 - 7,5		9	16,3-17,1	
	15	24,3 - 26,3		15	28,3-30,3	
200	6	2,1 - 2,9	200	6	3,2- 4,2	

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

EP/RSUV

① Degree of deflection of control lever	Upper rated speed rev/min		④ Control-lever deflection in degrees	Lower rated speed rev/min		③ Torque control rev/min	Control rod travel mm				
	1	2		3	4			5	6	7	8
250-800 ca.57	800	16,0	ca.16	250	6	780	0	* without auxiliary spring	50	19 - 21	50
	810	11,8		250	5,7-6,3				250	5,7-6,3	350
	820	7,6		280	2,7-4,2				280	2,7-4,2	250
	820	5,4-9,6		350	0 - 1				350	0 - 1	1,2 - 1,8
	840	1,6-3,4	* with auxiliary spring	250	3,7-4,8	250	1,2 - 1,8		300	0 - 1,7	
	880	0 - 1		300	0 - 1	300	0		350	0 - 1	

225-800 ca.57	800	16	ca.16	225	6	780	0
	810	11,8	*	50	19 - 21	350	0
	820	6,8		225	5,7-6,3		
	820	4,6-9,4		250	3,7-4,8	250	1,2 - 1,8
	840	1,6-3,2	*	300	0 - 1,7		
	900	1,6-3,2		350	0 - 1		
225-600*							
ca.68	600	16,0	ca.24	225	6	580	0
	610	10,5	*	50	19 - 21	300	0
	620	4,8		225	5,7-6,3		
	610	9 - 12		250	1,0-3,0	240	1,2 - 1,8
	620	3 - 7	*	280	0 - 1		
	650	0 - 1					

The numbers denote the sequence of the tests

DAI 20,1 f

B. Governor Settings

225-500**

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed rev/min		Torque control Control rod travel rev/min mm	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		8	9	10	11
ca.68	500	16,0	without auxiliary spring	ca.28	225	6	480	0		
	510	9,0			50	19 - 21	280	0		
2a	515	5,6	with auxiliary spring		225	5,7-6,3	240	2,0-4,0	240	1,2-1,8
	510	8 - 11			240	0 - 1	260			
	520	2 - 4								
	540	0 - 1								

Section C: Settings for fuel-injection pump with governor

MB 846 A

Column 1	2	3	4	5	6
Engine/pump speed min ⁻¹	Engine output	Test-oil temp.	Full-load delivery	Speed limitation U/min	
1500/750	225	20	730	190 - 193	760
		40		188 - 191	
1500/750	250	20	730	238 - 241	760
		40		235 - 238	
1600/800	240	20	780	211 - 214	810
		40		209 - 212	
1600/800	265	20	780	242 - 245	810
		40		239 - 242	
1200/600	205	20	580	220 - 224	610*
		40		218 - 222	
1000/500	170	20	480	227 - 231	510**
		40		224 - 229	
MB 846 Ab (pressure-charged)					
1500/750	300	20	730	258 - 261	760
		40		255 - 258	
1600/800	320	20		264 - 268	810
		40		261 - 265	
1600/800	350	20	780	278 - 282	810
		40		274 - 278	
1200/600	270	20	580	264 - 268	610*
		40		261 - 265	
1000/500	225	20	480	272 - 276	510**
		40		269 - 273	

Engine speed (Column 1) and engine output (Column 2) can be seen from engine nameplate; the data can be taken accordingly from Columns 4...6 and set on the test bench.

En

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4 BOS 9,7a

2. Edition

En

PE 5 A 100 C 312 LS 3014

RQ 300/1100 AB772D (1)

supersedes 12.71

PE 5 P 110 / 721 LS 213
(A)

RQ 250/1100 PA179D (2)*
RQ 300/1100 PA179D (3)*

company U 10 D 5

engine (176 PS - 1)
(192 PS - 2,3)

Cam sequence and angular spacing: 1 - 3 - 5 - 4 - 2 je 72°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5 + 0,1 mm (from BDC) -PE 5 A
2,8 + 0,1 mm (from BDC) -PE 5 P

Rotational speed rev/min	Control rod travel mm	Fuel delivery S 3014 cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery S 213 cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	7,8 - 8,6	0,4	12	10,8 - 11,6	
	6	3,5 - 4,5				
	12	12,6 - 13,7				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ .. 772 (1)

Checking of slider PRG check Control rod travel rev/min 1	Setting point rev/min 3	Full-load speed regulation			Setting point rev/min 7	Idle speed regulation			Torque control Control rod travel rev/min 11		
		Control rod travel mm 4	Test specifications rev/min 5	Control rod travel mm 6		Setting point rev/min 8	Test specifications rev/min 9	Control rod travel mm 10			
650	15,7-16,3	650	16,0	1115 1160 1200 1280	15,5-16,0 7,8-13,1 0 - 9 0	580	0	200 300 400 480	7,0-8,1 5,0-7,0 1,6-4,0 0	-	-

Torque-control travel on flyweight assembly dimension a = 0 mm

1 mm less control rod travel

Speed regulation: At

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min 3	Fuel delivery characteristics		Starting fuel delivery Idle speed rev/min 6	Control rod travel rev/min 7
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes/mm 7
1100	117,0-119,0 (116,0-120,0)	500	500	100,0-104,0 (99,0-105,0)	100	ca.17 mm RW

Checking values in brackets

11.73

K5

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point rev/min	Control rod travel mm	Setting point		Test specifications		Setting point rev/min	Control rod travel mm	Test specifications		Control rod travel mm	Control rod travel mm
		Control rod travel mm	Control rod travel mm	rev/min	rev/min			Control rod travel mm	rev/min		
1	2	3	4	5	6	7	8	9	10	11	12
500	15,7-16,3	500	16,0	1120	15,6-16,0	480	0	150	6,7-8,1	-	-
				1150	10,0-14,0			250	4,2-6,3		
				1200	0 - 7,5			350	0 -2,3		
				1260	0			0			

Torque-control travel
on flyweight assembly dimension a =

0 mm

Speed regulation At

1 mm less control
rod travel**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min	cm³/-1000 strokes	rev/min	3	rev/min	cm³/-1000 strokes	rev/min	cm³/1000 strokes / mm
1	2			4	5	6	7
1100	119,5-121,5					100	17 - 19

Checking values in brackets

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point rev/min	Control rod travel mm	Setting point		Test specifications		Setting point rev/min	Control rod travel mm	Test specifications		Control rod travel mm	Control rod travel mm
		rev/min	Control rod travel mm	Control rod travel mm	rev/min			Control rod travel mm	rev/min		
1	2	3	4	5	6	7	8	9	10	11	12
600	15,7-16,3	600	16,0	1120	15,6-16,0	550	0	200	7,0-8,1	-	-
				1150	10,0-14,5			300	4,4-6,8		
				1200	0 - 8,3			400	0 -2,7		
				1260	0			450	0		

Torque-control travel
on flyweight assembly dimension a =

0 mm

Speed regulation At

1 mm less control
rod travel

* When performing repairs, and in the event of idle problems, the idle springs – Item (2) – are to be changed from 1 424 617 016

to ... 018

and 2 shims in each case 1 200 102 624 are to be placed

beneath the idle springs

(at the same time changing nameplate to 300/1100)

- Item (3) – and both are to be adjusted in accordance with Item (3)!

Testoil-ISO 4113

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4 MB 16,0 a

3. Edition

En

PE 10 P 100/520/5 LS 800	RQ 300/1275 PA 100 DR RQV300-1250 PA 172 DR	supersedes	4.73
PE 10 P 100 A 520/5 LS 806	RQ 300/1250 PA 187 R RQV300-1250 PA 172 DR	company:	Daimler-Benz
320		engine:	OM 403

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 (+0,5)
0 - 45 - 72 - 117 - 144 - 189 - 216 - 261 - 288 - 333 - 360° (-0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) - Cyl. 10

(+ 0,1)
(- 0,05)

Adjust the fuel delivery from each outlet according to the values in

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ..PA 100 DR

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point	Control rod travel	Setting point	Control rod travel	Setting point	Control rod travel	Setting point	Control rod travel	Setting point	Control rod travel	Control rod travel	Control rod travel
rev/min	mm	rev/min	mm	rev/min	mm	rev/min	mm	rev/min	mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11	12
600	15,7-16,3	600	16,0	1270	15,6-16,0	570	0	150	6,8-8,1	-	-
				1300	11,0-15,0			250	5,1-7,2		
				1340	0 - 10,0			350	2,3-5,7		
				1410	0			470	0		

Torque-control travel
on flyweight assembly dimension a =

0 mm

1290-1310:

1 mm less control
rod travel

Speed regulation: At

Starting fuel delivery
idle speed

Control rod travel

cm³/1000 strokes/mm

rev/min cm³/1000 strokes/mm

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	Control rod travel	rev/min	Degree of deflection of control lever	Control rod travel	rev/min	Degree of deflection of control lever	Control rod travel	rev/min	Torque-control travel	
1	2	mm	4	5	mm	7	8	mm	rev/min	mm
ca.68	1250	15,0-18,2	-	-	-	ca.12	150	6,5-8,1	400	2,1-3,0
	1300	8,0-13,0					300	3,9-6,0	800	4,4-5,0
	1330	0 - 7,3					400	1,9-3,5	1200	8,2
	1410	0					710	0		

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)			Rotational-speed limitation		Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
1250	94,0-96,0	1290-1310*	600	74,0-79,0	100	14 - 16				
			1340	11 - 21) dispersion max. 6)		Change-over point				
						250-180 U/min				

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

RQ..PA 187 R

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point	Control rod travel	Control rod travel	Control rod travel	Test specifications	Setting point	Control rod travel	Control rod travel	Test specifications	Control rod travel	Control rod travel	Control rod travel
rev/min	mm	rev/min	mm	mm	rev/min	mm	mm	rev/min	mm	mm	mm
1	2	3	4	5	6	7	8	9	10	11	12
600	15,7-16,3	600	16,0	1270	15,6-16,0	540	0	200	6,9-8,1	-	-
				1300	7,5-13,0			300	4,2-6,5		
				1330	0 - 9,2			400	0 - 2,4		
				1380	0			440	0		

Torque-control travel
on flyweight assembly dimension a

mm

Speed regulation At 1290-1310; 1± 0,1

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed		Control rod travel	
rev/min	cm³/-1000 strokes	rev/min	mm	rev/min	cm³/-1000 strokes	rev/min	cm³/-1000 strokes / mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10
See page 1									

① Test Specifications Fuel Injection Pumps ① and Governors

En

SCA 11,0 d

40

Edition 5.70

PE 6 P 100/720 RS 31, Z RQV250-1100 PA 19 R

supersedes 6.67
company: Scania Vabis
engine: DS 11

PE 6 P 100/720 RS 31,Z,Y,X,V RQV...PA 19R, 33R,35R
Manifold-pressure compensator, see page 2,
reduced speeds and full-load deliveries, pages 3-4.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

S31,Z,X=2,6+0,1
S31,Y,V=2,4+0,1

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,6 - 14,2	0,6			3,5± 0,1* (max.3,2-3,9)
600	9	6,3 - 7,3				
	12	12,3 - 13,5				
200	6	0,6 - 1,2				
	9	4,1 - 5,2				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	min
1	2	3	4	5	6	7	8	9	10	11
68±1,5	1150	15,0-18,2	-	-	-	10±1,5	200	5,8-8,0	-	-
	1380	0 - 1,5					300	3,1-4,4		
62±1,5	1100	15,0-17,8					600	2,6-3,6		
	1150	10,2-13,8					500	1,8-3,0		
	1200	5,0-10,0					600	0,8-2,0		
	1250	0 - 5,6					780	0		
	1320	0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	rev/min 5	cm³/1000 strokes 6	rev/min 7	cm³/1000 strokes 8	rev/min 9	Control rod travel mm 10
** 1080	0,5 bar 144,5-147,5	1110-1130	** 600 ** 500	0,5 bar 139 - 143** 0 bar 122 - 130	100 225 dispersion max. 1,5	24 - 29 13 - 17* less than column 2			
** charge-air pressure									

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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K13

-K13

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Test oil temp 40°C (104°F)		Rotational-speed limitation Control-rod stop	RQV RQ	Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm³/1000 strokes			rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes
1	2		3	4	5	6	7

• * 0,5 bar		* 0,5 bar	100	24 - 29
1080	135,0-137,0	1120	600	124,0-128,0
				* 0 bar
			500	106,0-114,0

Pay particular attention to the following:

Basic adjustment of manifold-pressure compensator:

Horizontal position of cam (= without charge-air pressure) of full-load stop is to be set by way of stop screw in top of diaphragm housing.

Check:

S31 : Correct difference in control-rod travel between pressure-charging (0.5 atg or 350 mmHg) and induction (0 atg) = 0.8 ± 0.02 mm by means of headless setscrew on bottom of diaphragm housing.

S31 Z : As S31 however difference in control-rod travel = 0.9 mm.

Stop adjustment:

S31 : The full-load control-rod travel (approx. 12.5 mm) must have decreased by 0.1 mm at 0.29 - 0.31 atg (212 - 227 mmHg) and 500 min^{-1} .

S31 Z : The full-load control-rod travel (approx. 12.0 mm) must have decreased by 0.1 mm at 0.21 - 0.24 atg (157 - 180 mmHg) and 500 min^{-1} .

S31 : The full-load control-rod travel must have decreased by 0.7 mm at 0.22 - 0.25 atg (165 - 187 mmHg) and 500 min^{-1} .

S31 Z : The full-load control-rod travel must have decreased by 0.8 mm at 0.14 - 0.18 atg (102-134 mmHg) and 500 min^{-1} .

If these values are not attained, shims (as per service parts list) must be placed beneath the stop spring.

Full-load setting for pump ..S 31 Z with RQV 250 - 1100 PA 19 R:
(see Page 1 for control values and basic setting; refer to text above for adjustment of manifold-pressure compensator).

Full load setting see page 4!

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
250 - 700										
68±1,5	800	14,0-17,0	-	-	-	10±1,5	180	6,4-8,0	-	-
63±1,5	950	0 - 1,5					250	4,2-7,0		
	700	15,0-17,6					320	2,6-3,8		
	750	7,5-13,0					400	1,5-2,9		
	800	0 - 8,0					520	0		
	870	0								
250 - 750										
68±1,5	800	14,0-17,0	-	-	-	10±1,5	180	6,4-8,0	-	-
	950	0 - 1,5					250	4,2-6,5		
66±1,5	750	15,0-18,0					320	2,4-3,8		
	800	7,5-13,0					400	1,4-2,8		
	850	0 - 7,0					520	0		
	900	0								
250 - 800										
67±1,5	900	15,0-18,0	-	-	-	10±1,5	180	6,4-8,0	-	-
	1080	0 - 1,5					250	4,2-6,5		
63±1,5	800	15,0-17,6					320	2,3-3,8		
	850	10,0-14,0					450	1,0-2,3		
	900	4,0-10,0					580	0		
	1010	0								
250 - 850										
67±1,5	900	15,0-18,0	-	-	-	10±1,5	180	6,5-8,0	-	-
	1080	0 - 1,5					250	4,4-6,5		
65±1,5	850	15,0-18,0					320	2,2-3,8		
	900	9,0-14,0					450	1,0-2,3		
	950	1,0-10,0					570	0		
	1040	0								
250 - 900										
68±1,5	1000	15,0-18,2	-	-	-	10±1,5	180	6,0-8,0	-	-
	1200	0 - 1,5					250	4,0-6,2		
64±1,5	900	15,0-18,0					320	2,5-3,8		
	980	7,0-12,0					450	1,5-2,7		
	1050	0 - 6,4					630	0		
	1120	0								
375 - 900										
68±1,5	950	15,0-18,2	-	-	-	18±1,5	280	10,4-12,0	-	-
	1160	0 - 1,5					350	6,4- 9,2		
66±1,5	900	15,0-18,0					450	2,2- 3,5		
	950	10,0-14,0					550	1,0- 2,0		
	1000	4,5-10,0					660	0		
	1120	0								
250 - 950										
68±1,5	1000	15,0-18,2	-	-	-	10±1,5	180	6,3-8,0	-	-
	1200	0 - 1,5					250	4,3-6,5		
66±1,5	950	15,0-18,0					320	2,5-3,8		
	1000	10,0-14,0					450	1,4-3,0		
	1050	3,0-10,0					630	0		
	1150	0								

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel
1	2	3	2a	4	5	6	4	7	8	9	10	11
68±1,5	1150	15,0-18,2	-	-	-	-	10±1,5	180	6,4-8,0	-	-	-
	1360	0 - 1,5						250	4,3-6,5			
63±1,5	1000	15,0-18,0						320	2,8-3,8			
	1080	8,0-13,0						500	1,6-2,9			
	1150	1,6- 8,6						720	0			
	1270	0										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm³/1000 strokes	rev/min	4a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4a	4	5	6	7	8	9
600	140 - 142	Upper rated speed 200/min							
600	125 - 127								
600	158 - 160								
600	145 - 147								
600	151 - 153					max. charge-air pressure			

Checking values in brackets

* 1 mm less control rod travel than col. 2

1. 250 - 1050 3. 350/820 - 950
 2. 350/700 - 810 4. 350/750/900

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	Sliding sleeve travel
1	2	3	2a	4	5	6	4	7	8	9	10	11
1.	68±1,5	1150	15,0-18,2	-	-	-	10±1,5	180	6,4-8,0	-	-	-
	1360	0 - 1,5						250	4,3-6,5			
64±1,5	1050	15,0-17,6						320	2,8-3,8			
	1120	9,0-13,3						500	1,5-4,0			
	1200	0,5- 7,8						720	0			
	1300	0										
2.	68±1,5	810	15,0-19,0	45±1,5	650	14,5-15,5	3a	10±1,5	300	6,4-8,0	-	-
	825	8,0-14,0			700	9,0-15,0			350	3,8-6,3		
	840	0 - 8,0			725	5,0-10,0			400	3,6-4,0		
	865	0			750	1,0- 4,5			650	3,6-4,0		
					770	0			735	0		
3.	68±1,5	950	15,0-19,0	45±1,5	760	14,5-15,5	10±1,5	300	6,6-8,0			
	970	6,5-13,5			825	8,0-14,0			350	3,8-6,4		
	990	0 - 8,0			850	5,0- 9,5			400	3,6-4,0		
	1020	0			875	1,5- 5,0			750	3,6-4,0		
					900	0			860	0		
4.	66±1,5	900	15,0-19,0	55±1,5	700	14,5-15,5	10±1,5	300	7,0-8,0			
	920	7,0-14,0			760	13,0-15,5			350	5,0-7,4		
	940	0 - 9,0			800	6,6- 9,2			420	3,6-4,0		
	970	0			850	0			650	3,6-4,0		
									760	0		

②

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 KHD 11,3 b

1. Edition

En

Testoil-ISO 4113

PE 8 A 85 D 410 LS 2418 RQ 250/1200 AB 867DL
 300/1200
 RQV 300-1200 AB 915DL

supersedes
company KHD
engine F 8 L 413 W
(180 PS)

1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 ie 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 + 0,1 mm (from BDC) max. RW

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	5,0 - 5,5	0,4			
	6	1,3 - 2,1				
200	6	0,1 - 0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ 250/1200
300/1200 AB867DL

Checking of slider rev/min	Control rod travel mm	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	15,6-16,4	600	16,0	1240 1270 1300 1370	13,0-13,4 6,5-12,0 0,5-9,0 0	550	0	150 300 400 450	6,4-8,1 3,4-5,7 0-1,5 0	750 1000	15,8-16,0 13,4-13,7

Torque-control travel
on flyweight assembly dimension a = 0,8 mm Speed regulation At 1240 - 1250 = 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics			Starting fuel delivery	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000strokes	rev/min	cm³/1000strokes
1	2	3	4	5	6	7		
1200	67,5 - 69,5	600	1000 800	67,0 - 70,0 74,5 - 77,5	100	ca. 15 mm RW		

Checking values in brackets

9.75

BOSCH

Geschäftsbericht KH Kundendienst, Kfz-Ausrüstung
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② **Test Specifications
Fuel Injection Pumps
and Governors**

40

WPP 001/4 KHD 11,3 b

1. Edition

En

supersedes -
company K H D
engine F 8 L 413 W
(180 PS)

Testoil-ISO 4113

PE 8 A 85 D 410 LS 2418 RQ 250/1200 AB 867DL
 300/1200
 RQV 300-1200 AB 915DL

1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 ie 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 + 0,1

mm (from BDC)

max. RW

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	5,0 - 5,5	0,4			
	6	1,3 - 2,1				
200	6	0,1 - 0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ 250/1200 AB867DL
300/1200

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point	Test specifications	Control rod travel	Control rod travel	Control rod travel	Control rod travel						
Control rod travel rev/min	Control rod travel mm	rev/min	mm	rev/min	mm						
1	2	3	4	5	6	7	8	9	10	11	12
600	15,6-16,4	600	16,0	1240	13,0-13,4	550	0	150	6,4-8,1	750	15,8-16,0
				1270	6,5-12,0			300	3,4-5,7		
				1300	0,5-9,0			400	0 - 1,5	1000	13,4-13,7
				1370	0			450	0		

Torque-control travel
on flyweight assembly dimension a = 0,8 mm Speed regulation At 1240 - 1250 = 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics			Starting fuel delivery	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	cm³/1000strokes	rev/min	cm³/1000strokes
1	2	3	4	5	6	7		
1200	67,5 - 69,5	600	1000 800	67,0 - 70,0 74,5 - 77,5	100	ca. 15 mm RW		

Checking values in brackets

9.75

BOSCH

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①

Test Specifications Fuel Injection Pumps ① and Governors

VOL 10,0 e

4. Edition

40

En

PE 6 P 110/320 RS 138 RQV 200-1100 PA 99 /2 R (1)
 RS 138 RQV 250-1100 PA 233/2 R (1)
 A.. RS 138 Z RQV 200-1100 PA 99 /2 R (2)
 RS 138 Z RQV 250-1100 PA 233/2 R (2)
 RS 138 EP/RSV 200-900 P 1/305R(3)

supersedes 11.73
 company Volvo
 engine: Volvo-Penta
 D 100 B (1)
 HD100 D (2)
 MD100 B (3)

**

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6±0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	14,8-15,5	0,5			2,5±0,1* (max. 2,2-2,9)
600	9	7,6- 8,8				
	12	14,0-15,7				
	15	19,3-21,4				
200	9	5,1- 6,3				

* Adjust the fuel delivery from each outlet according to the values in

- * In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

B. Governor Settings

RQV .. PA 99/2

Upper rated speed Degree of deflection of control lever	rev/min	Control rod travel mm	1a 2a	Intermediate rated speed			Degree of deflection of control lever	rev/min	Control rod travel mm	Lower rated speed Degree of deflection of control lever	rev/min	Control rod travel mm	Sliding sleeve travel 1 3 10 11
				4	5	6							
ca.68	1150	15,5-18,3					ca.23	100	7,0-10	ca. .23	1100	7,8	
	1410	0						200	5,0-8,4				
ca.66	1100	15,0-18,0						300	2,4-5,2				
	1200	7,2-12,6						400	0 -2,2				
	1260	2,0- 9,0						460	0				
	1400	0											

RQV .. PA 233/2

ca.50 1170 15,0-18,3

ca.13 100 8,9-11 1170 8,3

1400 0

200 7,2-9,9

ca.45 1100 15,1-17,9

300 4,0-6,9

1180 8,2-13,3

380 0 -3,4

1260 0 - 7,8

490 0

1360 0

** Port-closing test with/without ROBO diaphragm

8.74

Checking values in brackets

* 1 mm less control rod travel than col. 2

K19

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm	1
1	2	3	2a	4	5	6	4	7	8	9	3	10	11	
ca. 50	900 950 1000	16,0 12,0 6,6		without spring		auxiliary		ca. 24	200 100 200	6 19 - 21 5,7-6,3		900 350 250	0 0 1,2-1,8	
	980 1020 1100	7,2-10,2 1 - 6 0 - 1		with auxiliary spring				(3a)	300	0 - 2,4				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤				
rev/min	cm³/1000 strokes	3	rev/min	4a	rev/min	cm³/1000 strokes	6	rev/min	cm³/1000 strokes	8	rev/min	control rod travel mm	9
(1 - D 100 D - S 138)													
700	109,0-111,0		1160-1170*		100	ca. 320		*	/	200			
(2 - HD 100 D - S 138 Z)				*****	200	10,0-14,0) max. 2,5)		***	***				
700	87,0- 89,0		1160-1170*		250	10,0-14,0) max. 2,5)		*	/	250			
(3 - MD 100 B - mit EP/RSV				*****				***	***				
ca. 10 mm RW-Carry	RW-Carry	out adjustment on engine											

Checking values in brackets

When checking extend by $\pm 1 \text{ cm}^3$ (col 2 and 5)!

* 1 mm less control rod travel than col 2

** dispersion

Bei RQV..PA 99/2 R Note sleeve position

*** Idle speed

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel					
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel rev/min	1a	Degree of deflection of control lever	rev/min	Control rod travel mm	4	Degree of deflection of control lever	rev/min	Control rod travel mm	3	rev/min	mm	1
1	2	3	2a	4	5	6	4	7	8	9	3	10	11	

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②			Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤				
rev/min	cm³/1000 strokes	3	rev/min	4a	rev/min	cm³/1000 strokes	6	rev/min	cm³/1000 strokes	8	rev/min	control rod travel mm	9

Checking values in brackets

En

* 1 mm less control rod travel than col 2

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4 DAI 10,8 o
Edition 2.64

En

PE 6 P 100/720 RS 4,5, 15 RQ 250/1100 P 10 D, 11 D

supersedes

company:

engine:

Daimler-Benz
OM 346
(180 PS)

See page 2

See Service Information VDT-WPP 115/1

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
	12	9,3 - 10,3				
1000	9	5,9 - 6,7				
	6	2,6 - 3,4				
200	9	2,5 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications	rev/min	Setting point rev/min	Control rod travel mm	Test specifications	rev/min	Control rod travel mm	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	15,6-16,4	600	16	1100	15,7-16,0	500	0	100	7,0-8,0	-	-
				1120	14,5-16,0			200	6,7-7,6		
				1150	10,4-14,0			250	6,0-6,6		
				1200	3,0- 5,0			300	4,5-5,5		
				1260	0			400	0,7-2,4		
								460	0		

1 mm less control
rod travel

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

rev/min

mm

Special notes on testing

1. Testing is performed with inertia flywheel EPKG 4.P 1 Z and flushing of fuel gallery. (Inlet on back of pump at boss of first pump barrel viewed from drive end. Return via overflow valve EPVE 176 P 2 Z likewise on back of pump at boss of 6th barrel).

2. Basic setting of governor:

Breakaway not before $n = 1100 \text{ min}^{-1}$. At $n = 1200$, the control-rod travel must not exceed a maximum of 8 mm.

3. Idle-speed regulation:

Check whether control-rod travel 6.0 – 6.6 is obtained at $n = 250 \text{ min}^{-1}$ (value in box, Section B, columns 9 and 10) and also whether control-rod travel is increased by at least 1.5 mm when reducing speed to $n = 100 \text{ min}^{-1}$.

4. Setting of full-load delivery:

Following setting at $n = 1090 \text{ min}^{-1}$, it is to be ensured that the full-load control-rod travel is not regulated by more than 1 mm at $n = 1125 – 1130 \text{ min}^{-1}$. The control-rod travel must be between 3 and 5 mm (value in box, Section B, columns 6 and 7) after increasing speed to $n = 1200 \text{ min}^{-1}$. If this is not the case, adjust governor springs and check idle-speed regulation again (item 3).

5. Setting control-rod stop:

With lever position determined as per item 4, reduce speed to $n = 500 \text{ min}^{-1}$ and read off control-rod travel. Then set stop such that at $n = 400 \text{ min}^{-1}$ same control-rod travel is obtained as previously with $n = 500 \text{ min}^{-1}$. The stop is to be set very "sensitively", so that the full-load/torque-control profile as of $n = 700 \text{ min}^{-1}$ is not influenced by excessive pressure. Particular attention is to be paid to proper functioning/freedom of movement of the stop.

6. Starting fuel delivery:

Replace guide bushing EPMB 61 P 2 ... 6 x accordingly if the values in Section C, column 7 (top) are not attained.

Test Specifications

Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4 PEN 7,0 a
2. Edition

En

PE 6 P 110/320 RS186 EP/RSV 250-1250 P2/358 2R (1)
PE 6 P 100 A 320 RS 54 EP/RSV 200-1250 P1/305 R (2)

supersedes 12.72
company Volvo-Penta
engine D 70 B

Port-closing test with/without ROBO diaphragm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

See page 2

A. Fuel Injection Pump Settings

Port closing at prestroke

$2,6 + 0,1$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	15,2-16,0	0,6 0,5	12	11,3-12,3	$2,5 \pm 0,1^*$ (max. 2,2-2,9)
600	9	8,8- 9,6		6	0,5- 1,2	
	12	15,2-17,0		9	4,6- 5,8	
	15	17,7-19,6		12	10,8-12,2	
200	9	6,1- 7,3		9	2,8- 4,0	

Adjust the fuel delivery from each outlet according to the values in
In the case of greater dispersion alter the delivery-valve spring pre-tension
accordingly.

B. Governor Settings

EP/RSV..P2/358/2R (1)

Degree of deflection of control lever	1 Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3			.	7	8	9	10	11
ca.50	1250	16,0				ca.19	250	6,0		
	1300	12,4	without auxiliary spring				150	19 - 21	1230	0
	1380	5,6					250	5,7-6,3	450	0
2a	1350	6,2-9,4	with auxiliary spring				300	4,6-5,3		
	1400	2,9-5,8					400	1,0-3,3	310	1,2-1,8
	1530	0,3-1,0					520	0 -1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat		3a Fuel delivery characteristics			Starting fuel delivery		5 Idle stop	
Test oil temp. 40°C (104°F)	rev/min	Note changed to	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	control rod travel mm	
1	2	3	4	5		6	7	8	9	
(1)	700	0,6 kp/cm² 131,0-133,0 (130,0-134,0)	1270	700	0 kp/cm² 66,0-70,0 (65,0-71,0)	250	dispersion max. 3			

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.73

K23

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K23

The numbers denote the sequence of the tests

B. Governor Settings

EP/RSV .. P1/305 R (2)

1 Degree of deflection of control lever	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control rev/min	Control rod travel mm
	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm		
ca.73	1250	16,0	without auxiliary spring	ca.27	200	6,0	1230	0	240	1,2-1,8
	1300	11,5			100	19 - 21				
2a	1350	5,4	with auxiliary spring		200	5,7-6,3	240	1,2-1,8		
	1320	7,6-10,5			250	3,5-4,6				
	1350	3,4- 6,4			350	0 - 1				

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)	6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 rev/min	4a Idle stop Control rod travel mm
	rev/min	cm³/1000 strokes	Note: changed to ...) rev/min	4	5 cm³/1000 strokes	6	7 cm³/1000 strokes	
(2) 700	79,0 - 81,0	1270	-	-	225 dispersion max. 2,5	11 - 15)*	

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

Setting of smoke limiter: (only for pump 186 with governor P2/358/2R) (1)

Basic adjustment of pump and governor without smoke limiter.

To test Section C, attach smoke limiter and connect compressed-air line to diaphragm housing.

At high charge-air pressure (in excess of 0.6 kp/cm²) the control-rod travel must be greater than that required for full-load delivery with charge-air pressure. Then adjust full-load delivery at 0.6 kp/cm² by means of adjusting screw in governor.

Set full-load delivery without charge-air pressure (0 kp/cm²) at adjusting screw of bell crank in smoke limiter.

Set stop screw in housing of smoke limiter such that there is 0.3 mm play between housing screw and screw in bell crank at max. charge-air pressure and max. full-load delivery.

Adjustment of guide sleeve (spring seat) in diaphragm housing:
Check start of adjustment and end of adjustment of smoke limiter at $n = 700 \text{ min}^{-1}$ -

Start of adjustment	= 0.18 - 0.22 kp/cm²
End of adjustment	= 0.46 - 0.50 kp/cm²

Effect correction by turning guide sleeve of helical spring.

②

Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4 STE 8,1a
Edition 3.72

En

PE 6 P 110/721 RS 108 RQ 250/1300 PA 65 DR
 (A) RS 108 RQ 300/1300 PA 65 DR, 134DR
 RS 195,Z RQ 300/1300 PA 134 DR
 RS 156,Z RQV250-1300 PA 114 DR

supersedes 12.70
 company: Steyr
 engine: WD 614.60-230 PS
 "Z"WD 614.69-250 PS
 "Z"WD 614.79-250 PS

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	9,8 - 10,5	0,5			
600	9	3,2 - 4,2				
600	12	8,2 - 9,4				
600	15	13,7 - 15,3				
200	9	1,1 - 2,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ ..

Checking of slider PRG check	Control rod travel mm	Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
250/1300 PA DR										*	a = 0,3 mm
550 15,7-16,3	550	16,0	1320	14,6-15,0	550	0	100	6,3-8,1	700	15,8-16,0	
			1350	7,4-13,4			200	4,7-6,9	800	15,3-15,6	
			1380	0 - 9,0			300	2,0-4,3	950	15,0-15,2	
			1440	0			410	0		a = 0,3 mm	
300/1300 PA65DR											

* Torque-control travel on flyweight assembly dimension a = mm 1 mm less control rod travel

600 15,7-16,3	600 16,0	1320	14,6-15,0	550	0	100	7,1-8,1	850	15,8-16,0
		1350	8,0-13,8			200	5,9-8,1		
		1380	0,3- 9,6			300	3,7-5,8	1100	15,0-15,2
		1450	0			460	0		

300/1300 PA134DR * a = 0,2 mm

600 15,7-16,3	600 16,0	1320	15,0-15,4	550	0	100	6,8-8,1	850	15,8-16,0
		1350	8,0-13,8			200	5,9-8,1		
		1380	0,3- 9,6			300	3,5-5,8	1050	15,2-15,4
		1450	0			460	0		

En

Testoil-ISO 4113

L1

L1

B. Governor Settings**Testoil-ISO 4113**

1 Upper rated speed rev/min			Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca .66	1300	15,0-17,6	-	-	-	ca .10	150	6,4-8,0	1300	
	1350	11,0-14,8					300	3,0-5,2	1100	0,3-0,5
	1400	6,4-12,0					400	2,1-3,5	900	0,6-0,8
2a	1470	0 - 7,3	Torque-control travel a = 1,0				550	1,2-2,4	600	0,9-1,1
	1570	0					780	0		

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.	3a Fuel delivery characteristics		Starting fuel delivery		5	4a Idle stop
Test oil temp. 40°C (104°F)	rev/min	Note: changed to ...	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	idle	Control rod travel mm
	1	2	3	4	5	6	7	8
PE..	108, 156, 195	- RQ + RQV:	1320(RQV)		0,6 kp/cm²	100	12 -13	
1300	0,6 kp/cm²			900	111,5-114,5			
	115,0-117,0			700	110,0-114,0			
1300	0 kp/cm²			500	98,0-104,0			
PE..	111,0-113,0	- RQ + RQV:						
156Z + 195Z	0,6 kp/cm²	1320(RQV)		0,6 kp/cm²	100	12 -14		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1300	117,0-119,0	900	114,5-117,5
	0 kp/cm²	700	114,0-118,0
1300	113,0-115,0	500	104,0-110,0

Setting of smoke limiter:

1. Basic adjustment of pump and governor (Section A-B) without smoke limiter.
2. Adjust full-load delivery (quantity indication with charge-air pressure) at full-load stop screw of governor, check fuel-delivery characteristics.
3. Attach smoke limiter; adjustment test at 500 min⁻¹.
Set start (0.3 kp/cm²) and end (0.46 kp/cm²) at guide sleeve (spring seat); difference between induction and pressure-charging approx. 0.6 mm control-rod travel.
4. Set full-load delivery at 0 kp/cm² on bell crank of smoke limiter.
5. Correct full-load delivery -0.5 cm³ at 500 min⁻¹ and 0.5 kp/cm² at housing of smoke limiter; measure fuel-delivery characteristics at increasing engine speeds.

①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 DAI 10,8 q
Edition 2.64

En

PE 6 P 100/720 RS 15

RQV 250-1100 P 12 D
P 13 D
* PA20 DR

supersedes

company:

Daimler-Benz
OM 346
(210 PS)

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	9,3 - 10,3				
	6	2,6 - 3,4				
	9	5,9 - 6,7				
200	9	2,5 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			Control rod travel mm 4	Degree of deflection of control lever 7	Control rod travel mm 8	Sliding sleeve travel mm 10	
			Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6					
ca.66	1100	15 -17,8	-	-	-	ca.10	150	7,5- 8	1100	0
	1120	12,6-16					250	5 - 7	900	0,2-0,4
	1150	9,5-13,7					350	3,4-3,8		
	1200	3,2- 9,6					500	2,2-3,8	700	0,3-0,5
	1250	0 - 5,2					600	1,1-2,4	500	0,4-0,6
	1300	0					730	0		

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 3		Fuel delivery characteristics high idle speed 5a		Starting fuel delivery idle switching point 6		Torque-control travel Control rod travel mm 5	
rev/min	cm³/1000 strokes	rev/min	4	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1090	100,5-102,0	1110-1120	900 700 450	98,5-100,5 99,5-102,0 87,5- 91,0		100	15 - 16		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

Special notes on testing

1. Testing is performed with inertia flywheel EPKG 4 P 1 Z and flushing of fuel gallery. (Inlet on back of pump at boss of first pump barrel viewed from drive end. Return via overflow valve EPVE 176 P 2 Z likewise on back of pump at boss of 6th barrel).
2. Testing and adjustment of governor and full-load delivery as per WPP 001/4, however the following additional test is to be performed after setting the full load.

At $n = 600 \text{ min}^{-1}$ and with control lever in full-load position, read off control-rod travel and then slowly move control lever in STOP direction. The control-rod travel must not be subject to further increase in the process.

En

L4

L4

② **Test Specifications
Fuel Injection Pumps ②
and Governors**

40

VDT-WPP 001/4 BOS 12,3 c

3. Edition

En

PE 6 P 110 / 821 LS 139	RQ 250/1100 PA 96 D
PE 6 P 110/ 821 LS 182	RQ 250/1100 PA 96 D
PE 6 P 110/ 821 LS 139Y	RQ 250/1100 PA 96 D
PE 6 P 110A 821 LS 139	RQV250-800/1100 PA 149

supersedes 12.72
company: Büssing
engine: U 12 DA 62
(310 PS-1,4)
(280 PS-2)
(320 PS-3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) Cyl. 6

(+0,15)
(-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,7 - 13,4	139	12	14,3 - 15,1	
600	9	6,1 - 7,3		9	8,0 - 9,2	
600	12	11,9 - 13,4		12	13,3 - 14,8	
600	15	16,5 - 18,2		15	17,7 - 19,4	
200	9	4,2 - 5,4		9	5,8 - 7,0	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ.. 96 D

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point	Test specifications	Setting point	Test specifications	Setting point	Test specifications	Control rod travel	Control rod travel	Control rod travel	Control rod travel	Control rod travel	Control rod travel
Control rod travel rev/min 1	Control rod travel mm 2	Control rod travel rev/min 3	Control rod travel mm 4	Control rod travel rev/min 5	Control rod travel rev/min 6	Control rod travel rev/min 7	Control rod travel mm 8	Control rod travel rev/min 9	Control rod travel mm 10	Control rod travel rev/min 11	Control rod travel mm 12
500	15,7-16,3	500	160	1120	15,6-16,0	480	0	150	6,7-8,1	-	-
				1150	10,0-14,0			250	4,2-6,3		
				1200	0 - 7,5			350	0 - 2,2		
				1260	0			390	0		

Torque-control travel
on flyweight assembly dimension a = 0 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	③a	Fuel delivery characteristics		③b	Starting fuel delivery idle speed		⑥
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5		rev/min 6	cm ³ /1000 strokes/mm 7	Control rod travel
	0,6 bar	--		0	bar				
1100	168,0 - 172,0	(1)		1100	106,0-110,0		100		ca.24
1100	162,0 - 166,0	(2)		1100	108,0-112,0		100		ca.24
1100	171,0 - 174,0	(3)		1100	109,0-113,0		100		ca.24

Checking values in brackets

12.74

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel				
Degree of deflection of control lever	rev/min	Control rod travel mm	①a	Degree of deflection of control lever	rev/min	Control rod travel mm	④	Degree of deflection of control lever	rev/min	Control rod travel mm	③	Sliding sleeve travel ①	
1	2	3	②a	4	5	6	④	7	8	9	③	10 rev/min	11 mm
ca.68	1100	14,0-16,0	ca.62	700	14,5-17,0	ca.12	150	6,4-8,0	200	0,2-1,3	1		
	1150	7,0-12,4		800	6,8- 9,6		250	3,7-6,0	350	2,0-3,4			
	1200	0 - 7,4		900	0,6- 1,0		350	0,7-1,9	700	5,8-6,2			
	1270	0		1100	0,6- 1,0		500	0	900-	8,2			
				1150	0				1100				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min
1	2	3	4	5	6
0,6	bar		0	bar	
1100	174,0-177,0	1120	1100	106,0-110,0	

Checking values in brackets

* 1 mm less control rod travel than col. 2

Setting of manifold-pressure compensator (LDA):

1. Basic adjustment of pump and governor (Section A-B) without LDA.
2. Set full-load delivery (data with charge-air pressure) at full-load stop screw of governor.
Check fuel-delivery characteristics if applicable.
3. Attach LDA.
4. Set start of adjustment at guide sleeve (spring seat) of diaphragm housing.
5. Set full-load delivery (data without charge-air pressure) at bell crank of smoke limiter.
6. Correct full-load delivery minus 0.5 cm³ with full-load travel and at full-load speed using hexagon bolt of housing - max. charge-air pressure.
7. Check end of adjustment.
8. Stop adjustment - n = 500 min⁻¹ - increasing pressure in bar:

	Item (1, 3)	(2)	(4)
Setting	0.02-0.04	0.04-0.07	0.01-0.04
Measurement	0.52-0.55	0.46-0.50	0.52-0.54
Difference in control-rod travel	approx. 4.9	approx. 3.6	approx. 4.4 mm

Testoil-ISO 4113

1

②

Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4 MB 11,0 a
1. Edition

En

PES 6 P 100 A 820 LS 264 RQ 300/1100 PA 186 D
LS 264Z (V11490D)

supersedes

company:

engine:

Daimler-Benz

OM 407 h

(180PS, 210PS)

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Cyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,5 - 10,2	0,4			
600	9	3,1 - 4,3				
600	15	13,2 - 15,7				
200	9	1,4 - 2,4				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check Control rod travel rev/min 1		Full-load speed regulation Setting point Control rod travel rev/min 3				Idle-speed regulation Setting point Control rod travel mm 8				Torque control Control rod travel mm 12	
		Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 9	Control rod travel mm 10	rev/min 11	rev/min 11	Control rod travel mm 12	
600	15,7-16	600	16,0	1110	15,6-16,0	550	0	220	7,0-8,1	-	-
				1150	5,4-12,5			300	4,9-7,2		
				1180	0 - 8,2			380	1,6-4,2		
				1230	0			450	0		

Torque-control travel
on flyweight assembly dimension a =

0

mm

1145-1165

1 mm less control
rod travel

Speed regulation: At

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes/mm 7	
1100	89,0 - 91,0 (88,0 - 92,0)		600			100	13,5 - 15,5
"Z" 1100	109,0 - 111,0 (108,0 - 112,0)		600				

Checking values in brackets

11.73

L9

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Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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Test sequence for pump ..S 264:

On account of the special flange, this fuel-injection pump cannot be clamped on to the test bench with the existing holding pieces. A special test sequence is thus necessary:

1. Detach drive flange with KDEP 1033; remove pointer and clamping flange.
2. Screw on flange EFEP 157/7 - 1 685 720 060 and insert it into universal clamping bracket EFEP 157 (125 mm) or EFEP 157 A (110 mm).
- Tighten clamps.
3. Fit supporting frame EFEP 433 (110 mm) - 1 688 030 030
EFEP 444 (125 mm) - 1 688 030 033 on governor end.
4. Install driving coupling for test bench and perform test in accordance with WPP 115/1 (pump) and WPP 001/4 (governor) - as usual -, however
5. remove clamping flange and clamping bracket following completion of test. Governor-end supporting frame and fuel-injection tubing as well as inlet line remain closed. Fit motor flange with pointer and drive flange.
6. Attach prestroke measuring device to cyl. 6.

Set start of delivery in accordance with high-pressure overflow method and transfer pointer mark to drive flange.

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 SCA 14,0a

2. Edition

En

PE 8 P 110/920/4	LS132	RQV 225-1150 PA88R	(1)	supersedes	12.71
PE 8 P 110A920/4	LS207	RQV 225-1150 PA89R	(2)	company:	Scania
PE 8 P 100/920/4	LS133	RQV 225-1150 PA89R	(2)	engine:	DS 14 (1)
PE 8 P 110A920/4	LS208	RQV 225-1150 PA89R	(3)		D 14 (2,3)

Port-closing test with/without ROBO diaphragm

Cam sequence and angular cam spacing. 1-2-7-3-4-5-6-8 je 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,6+0,1 \text{ } (-0,1)$ mm (from BDC) 132,207
 $3,0+0,1 \text{ } (-0,05)$ mm (from BDC) 133,208

 $(+0,5)$
 $(-0,75)$

Rotational speed rev/min	Control rod travel mm	Fuel delivery 11 Ø cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery 10 Ø cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1000	12	12,8 - 13,6	0,6	12	11,4 - 12,2	$2,5 \pm 0,1^*$
600	6	0,8 - 1,8		9	5,4 - 6,6	(max. 2,2-2,9)
600	12	12,2 - 13,7		12	10,6 - 12,1	
600	15	17,2 - 18,8		15	15,3 - 17,1	
200	6	0,6 - 1,6		9	3,6 - 4,6	

Adjust the fuel delivery from each outlet according to the values in _____.

Testoil-ISO 4113

B. Governor Settings

RQV .. PA88, 89 (1..3)

Upper rated speed Degree of deflection of control lever	rev/min	Control rod travel mm	1a	Intermediate rated speed			Degree of deflection of control lever	rev/min	Control rod travel mm	3a	Lower rated speed			Sliding sleeve travel 1 rev/min
				Degree of deflection of control lever	rev/min	Control rod travel mm	4	5	6	7	8	9	10	11
ca.66	1210 1300 1400 1540	14,8-17,6 9,1-13,4 1,8- 8,2 0	1a	-	-	-	ca.10	100 250 400 510	6,6-8,0 4,0-5,8 1,5-2,9 0	1220	8,3	-	-	

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm³/1000 strokes	2b	4a	5a	6	5
1	2		3	4	8	8
0,7 kp/c,² 1100 (14±0,5 mm RW)	162,0-164,0		1170	0,7 kp/cm² 600 0 kp/cm² 500	100 225 1800	190 - 240 10 - 12 ** max. 1,5) 49 - 53 ** max. 4
When checking extend by ± 1 cm		(col 2 and 5)!				

Checking values in brackets

** dispersion

* 1 mm less control rod travel than col. 2

10.74

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The numbers denote the sequence of the tests

B. Governor Settings

RQV..PA 89 (2...3)

① Upper rated speed rev/min			Intermediate rated speed			④ Control-lever deflection in degrees		Lower rated speed rev/min		③ Torque control rev/min	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	7	8	9	10	11	
1	2	3	4	5	6	7	8	9	10	11	
ca.66	1210	14,8-17,6	-	-	-	ca.10	100	6,6-8,0	1220	8,3	
	1300	9,1-13,4					250	4,0-5,8			
	1400	1,8- 8,2					400	1,5-2,9			
	1540	0					510	0			
2a											

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limitat. Note: changed to ...) rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤	④a Idle stop Control rod travel mm	
rev/min	cm³/1000 strokes	3	4	5	6	7	8	9	
(2) 1100 (12 ± 0,5 mm RW)	114,0-116,0	1170	600	110,0-114,0	100	190 - 240			
					225	10 - 12)*			
					1200	** max. 1,5 46,5-51,5 ** max. 4)			
(3) 1100 (11 ± 0,5 mm RW)	117,0-119,0				225	9 - 11) ** max. 1,5 *(ca. 6mmRW)			

Checking values in brackets

** dispersion

* 1 mm less control rod travel than col. 2

1200 45-49

** max. 4) (ca. 6 mm RW)

Setting of manifold-pressure compensator (LDA) - only with PA 88 R:

Basic setting of pump and governor (Sections A - B) without LDA. Attach LDA: At 500 min^{-1} and 0 kp/cm^2 (without charge-air pressure) set full-load delivery at stop screw of bell crank.

By pressing on diaphragm (connect up compressed air), adjust stop such that there is more control-rod travel than is required for full-load delivery with maximum charge-air pressure.

Then set full-load delivery at stop screw in housing at 1100 min^{-1} and 0.7 kp/cm^2 and measure fuel-delivery characteristics.

Check difference in control-rod travel between pressure-charging and induction = approx. 1.2 mm.

Stop adjustment (decreasing pressure):

The full-load control-rod travel must have decreased by 0.1 mm at $0.27 - 0.29 \text{ kp/cm}^2$ (197-213 mmHg) and 500 min^{-1} .

The full-load control-rod travel must have decreased by 0.8 mm at $0.18-0.21 \text{ kp/cm}^2$ (130-154 mmHg) and 500 min^{-1} .

Adjust by altering initial tension of spring, i.e. turn guide bushing of helical spring.

①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4
Edition 11.11.69

En

PES 6 P 110/720 RS 135

RQV 275-1050 PA 92 KR
PA130 KR

supersedes

company:
engine:Mack
ENDT 675

Test equipment: nozzle DLL 155 S 482 = 230 bar
 Nozzle-holder assembly KBL 90 S 119/4 fuel lines 6 x 2,1" x 920 mm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm³/100 strokes	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery cm³/100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	14,5 - 15,0	0,6			
600	6	3,5 - 4,6				
600	12	15,7 - 17,2				
600	15	20,7 - 22,5				
200	6	2,7 - 3,8				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed Degree of deflection of control lever	rev/min	Control rod travel mm	⑩	Intermediate rated speed			④	Lower rated speed			③	Sliding sleeve travel ①	
				②	③	④		⑤	⑥	⑦		⑩	⑪
ca.66	1050	15,0-17,7	-	-	-	-	ca.10	200	7,3-8,0	1050	11,8		
	1100	10,0-14,0						300	3,7-5,6	800	12,3		
	1180	0 - 7						450	1,9-3,2	600	13,2		
	1260	0						680	0	500	12,9		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed ⑤a idle speed ⑤b		Starting fuel delivery idle switching point		⑥	Torque-control travel Control rod travel mm
rev/min	cm³/1000 strokes	②	③	④	⑤	⑥	⑦	⑧
1050	136,0-140,0		1070	800 600 500	154,0-159,0 177,5-183,5 169,0-175,0	100 275 1140	ca.165 17 - 19	

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Sliding sleeve travel	U/min	mm RW
	100	0
	256	0 - 1
	400	2,1 - 2,7
	700	3,9 - 4,4
	1000	7,3 - 7,7
	1180 - 1260	11

Testoil-ISO 4113

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